

Prophetic Cords of Birthing Prayer

Umbilical Cord-The Spirit of God's Grace and His Release

Contents

1	Umbilical cord	1
1.1	Physiology in humans	1
1.1.1	Development and composition	1
1.1.2	Connection to fetal circulatory system	2
1.1.3	Physiological postnatal occlusion	2
1.1.4	Problems and abnormalities	2
1.2	Medical protocols and procedures	2
1.2.1	Clamping and cutting	3
1.2.2	Storage of cord blood	4
1.3	The umbilical cord in other animals	5
1.4	Other uses for the term “umbilical cord”	5
1.5	Cancer-causing toxins in human umbilical cords	5
1.6	Additional images	5
1.7	See also	6
1.8	References	6
1.9	External links	8
2	Latin	9
2.1	Legacy	9
2.1.1	Inscriptions	9
2.1.2	Literature	9
2.1.3	Linguistics	10
2.1.4	Education	10
2.1.5	Official status	11
2.2	History	11
2.2.1	Old Latin	11
2.2.2	Classical Latin	11
2.2.3	Vulgar Latin	12
2.2.4	Medieval Latin	12
2.2.5	Renaissance Latin	12
2.2.6	New Latin	13
2.2.7	Contemporary Latin	13
2.3	Phonology	14

2.3.1	Consonants	14
2.3.2	Vowels	14
2.4	Orthography	15
2.4.1	Alternate scripts	16
2.5	Grammar	16
2.5.1	Nouns	16
2.5.2	Adjectives	17
2.5.3	Prepositions	17
2.5.4	Verbs	17
2.6	Vocabulary	18
2.7	Phrases	19
2.8	Numbers	19
2.9	Example text	19
2.10	See also	20
2.11	Notes	20
2.12	References	21
2.13	External links	22
2.13.1	Language tools	22
2.13.2	Courses	22
2.13.3	Grammar and study	22
2.13.4	Phonetics	22
2.13.5	Latin language news and audio	23
2.13.6	Latin language online communities	23
3	Vaginal ultrasonography	24
3.1	Uses	24
3.2	References	24
4	Allantois	25
4.1	Function	25
4.1.1	In reptiles, birds, and monotremes	25
4.1.2	In most marsupials	25
4.1.3	In placental mammals (Eutheria)	25
4.2	Clinical significance	25
4.3	Etymology	25
4.4	Additional images	25
4.5	References	27
4.6	External links	27
5	Cord blood	28
5.1	Medical uses	28
5.2	Adverse effects	28

5.3	Collection and storage	28
5.4	History	28
5.5	Society and culture	28
5.5.1	Regulation	28
5.5.2	Private and public banks	28
5.6	Research	29
5.7	References	29
5.8	Text and image sources, contributors, and licenses	31
5.8.1	Text	31
5.8.2	Images	34
5.8.3	Content license	36

Chapter 1

Umbilical cord

In placental mammals, the **umbilical cord** (also called the **navel string**,^[1] **birth cord** or **funiculus umbilicalis**) is a conduit between the developing **embryo** or **fetus** and the **placenta**. During **prenatal development**, the umbilical cord is physiologically and genetically part of the fetus and, (in humans), normally contains two **arteries** (the **umbilical arteries**) and one **vein** (the **umbilical vein**), buried within **Wharton's jelly**. The umbilical vein supplies the fetus with **oxygenated, nutrient-rich blood** from the **placenta**. Conversely, the fetal heart pumps deoxygenated, nutrient-depleted blood through the umbilical arteries back to the placenta.



Cross section of umbilical cord. Top right and top left: umbilical artery, bottom: umbilical vein, middle: remnant of allantois.

1.1 Physiology in humans

1.1.1 Development and composition



Vaginal ultrasonography of an embryo of a gestational age of 8 weeks and 3 days. The embryo is surrounded by the thin membranes of the amniotic sac, the umbilical cord is seen in the center, attaching the embryo to the placenta.

The umbilical cord develops from and contains remnants of the **yolk sac** and **allantois** (and is therefore derived

from the **zygote**). It forms by the fifth week of fetal development, replacing the yolk sac as the source of nutrients for the fetus.^[2] The cord is not directly connected to the mother's circulatory system, but instead joins the **placenta**, which transfers materials to and from the mother's blood without allowing direct mixing. The length of the umbilical cord is approximately equal to the **crown-rump length** of the fetus throughout pregnancy. The umbilical cord in a full term **neonate** is usually about 50 **centimeters** (20 in) long and about 2 centimeters (0.75 in) in diameter. This diameter decreases rapidly within the placenta. The fully patent umbilical artery has two main layers: an outer layer consisting of circularly arranged smooth muscle cells and an inner layer which shows rather irregularly and loosely arranged cells embedded in abundant **ground substance** staining **metachromatic**.^[3] The smooth muscle cells of the layer are rather poorly differentiated, contain only a few tiny **myofilaments** and are thereby unlikely to contribute actively to the process of postnatal closure.^[3]

The umbilical cord contains **Wharton's jelly**, a gelatinous substance made largely from **mucopolysaccharides** which protects the blood vessels inside. It contains one vein, which carries oxygenated, nutrient-rich blood to the fetus, and two arteries that carry deoxygenated, nutrient-depleted blood away. Occasionally, only two vessels (one

vein and one artery) are present in the umbilical cord. This is sometimes related to fetal abnormalities, but it may also occur without accompanying problems.

It is unusual for a vein to carry oxygenated blood and for arteries to carry deoxygenated blood (the only other examples being the **pulmonary veins** and **arteries**, connecting the lungs to the heart). However, this naming convention reflects the fact that the umbilical vein carries blood towards the fetus's heart, while the umbilical arteries carry blood away.

The blood flow through the umbilical cord is approximately 35 ml / min at 20 weeks, and 240 ml / min at 40 weeks of gestation.^[4] Adapted to the weight of the fetus, this corresponds to 115 ml / min / kg at 20 weeks and 64 ml / min / kg at 40 weeks.^[4]

1.1.2 Connection to fetal circulatory system

The umbilical cord enters the fetus via the **abdomen**, at the point which (after separation) will become the **umbilicus** (or navel). Within the fetus, the umbilical vein continues towards the **transverse fissure** of the liver, where it splits into two. One of these branches joins with the **hepatic portal vein** (connecting to its left branch), which carries blood into the liver. The second branch (known as the **ductus venosus**) bypasses the liver and flows into the **inferior vena cava**, which carries blood towards the heart. The two umbilical arteries branch from the **internal iliac arteries**, and pass on either side of the **urinary bladder** into the umbilical cord, completing the circuit back to the placenta.^[5]

1.1.3 Physiological postnatal occlusion

In absence of external interventions, the umbilical cord occludes physiologically shortly after birth, explained both by a swelling and collapse of **Wharton's jelly** in response to a reduction in temperature and by **vasoconstriction** of the blood vessels by smooth muscle contraction. In effect, a natural clamp is created, halting the flow of blood. In air at 18 °C, this physiological clamping will take three minutes or less.^[6] In **water birth**, where the water temperature is close to body temperature, normal pulsation can be 5 minutes and longer.

Closure of the umbilical artery by vasoconstriction consists of multiple constrictions which increase in number and degree with time. There are segments of dilatations with trapped uncoagulated blood between the constrictions before complete occlusion.^[7] Both the partial constrictions and the ultimate closure are mainly produced by muscle cells of the outer circular layer.^[3] In contrast, the inner layer seems to serve mainly as a plastic tissue which can easily be shifted in an **axial** direction and then folded into the narrowing lumen to com-

plete the closure.^[3] The vasoconstrictive occlusion appears to be mainly mediated by **5-hydroxytryptamine**^{[8][9]} and **thromboxane A₂**.^[8] The artery in cords of preterm infants contracts more to **angiotensin II** and **arachidonic acid** and is more sensitive to **oxytocin** than in term ones.^[9] In contrast to the contribution of Wharton's jelly, cooling causes only temporary vasoconstriction.^[9]

Within the child, the umbilical vein and ductus venosus close up, and degenerate into fibrous remnants known as the **round ligament of the liver** and the **ligamentum venosum** respectively. Part of each umbilical artery closes up (degenerating into what are known as the **medial umbilical ligaments**), while the remaining sections are retained as part of the circulatory system.

1.1.4 Problems and abnormalities



A knotted cord on a newborn baby.

A number of abnormalities can affect the umbilical cord, which can cause problems that affect both mother and child.^[10]

- **Umbilical cord compression** can result from, for example, entanglement of the cord,^[11] a knot in the cord,^[11] or a **nuchal cord**,^[11] (which is the wrapping of the umbilical cord around the fetal neck)^[12] but these conditions do not always cause obstruction of fetal circulation.
- **Velamentous cord insertion**
- **Single umbilical artery**
- **Umbilical cord prolapse**
- **Vasa praevia**

1.2 Medical protocols and procedures



The umbilical cord is about to be cut with scissors via cesarean section



Umbilical cord clamp



A day-old baby with its cord stump still attached.

1.2.1 Clamping and cutting

The cord can be clamped at different times; however delaying the clamping of the umbilical cord until one minute after birth improves outcomes as long as there is the ability to treat **jaundice** if it occurs.^[13] Clamping is followed by cutting of the cord, which is painless due to the absence of **nerves**. The cord is extremely tough, like thick **sinew**, and so cutting it requires a suitably sharp instrument. While umbilical severance may be delayed until after the cord has stopped pulsing (5–20 minutes after birth), there is ordinarily no significant loss of either venous or arterial blood while cutting the cord. Current evidence neither supports, nor refutes, delayed cutting of



A 7 cm (2.75 in) long detached umbilical cord.

the cord, according to the **American Congress of Obstetricians and Gynecologists (ACOG)** guidelines.

There are umbilical cord clamps which incorporate a knife. These clamps are safer and faster, allowing one to first apply the cord clamp and then cut the umbilical cord. After the cord is clamped and cut, the newborn wears a plastic clip on the navel area until the compressed region of the cord has dried and sealed sufficiently.

The length of umbilical left attached to the newborn varies by practice; in most hospital settings the length of cord left attached after clamping and cutting is minimal. In the United States, however, where the birth occurred outside of the hospital and an **emergency medical technician (EMT)** clamps and cuts the cord, a longer segment up to 18 cm (7 in) in length^{[14][15]} is left attached to the newborn.

The remaining umbilical stub remains for up to 10 days as it dries and then falls off.

Early versus delayed clamping

A **Cochrane review** in 2013 came to the conclusion that delayed cord clamping (between one and three minutes after birth) is “likely to be beneficial as long as access to treatment for jaundice requiring phototherapy is available”.^[16] In this review delayed clamping, as contrasted to early, resulted in no difference in risk of severe maternal **postpartum hemorrhage** or neonatal mortality, low **Apgar score**. On the other hand, delayed clamping resulted in an increased birth weight of on average about 100 g, and an increased **hemoglobin** concentration of on average 1.5 g/dL with half the risk of being iron deficient at three and six months, but an increased risk of jaundice requiring **phototherapy**.^[16]

In 2012, the American College of Obstetricians and Gynecologists officially endorsed delaying clamping of the umbilical cord for 30–60 seconds with the newborn held below the level of the placenta in all cases of preterm delivery based largely on evidence that it reduces the risk of intraventricular hemorrhage in these children by 50%.^[17] In the same committee statement, ACOG also recognize

several other likely benefits for preterm infants, including “improved transitional circulation, better establishment of red blood cell volume, and decreased need for blood transfusion”, as well as several for full term infants, including improved iron stores and increased blood volume, however it stopped short of endorsing delayed clamping for term infants due to a lack of evidence showing that these improved final outcomes or outweighed the increased risk of **polycythemia** or **hyperbilirubinemia**^[18] associated with delayed clamping.^[17]

Several studies have shown benefits of delayed cord clamping: A meta-analysis^[19] showed that delaying clamping of the umbilical cord in full-term neonates for a minimum of 2 minutes following birth is beneficial to the newborn in giving improved **hematocrit**, iron status as measured by **ferritin** concentration and stored iron, as well as a reduction in the risk of anemia (**relative risk**, 0.53; 95% CI, 0.40-0.70).^[19] A decrease was also found in a study from 2008.^[20] Although there is higher hemoglobin level at 2 months, this effect did not persist beyond 6 months of age.^[18] Not clamping the cord for three minutes following the birth of a baby improved outcomes at four years of age.^[21]

Negative effects of delayed cord clamping include an increased risk of **polycythemia**. Still, this condition appeared to be benign in studies.^[19] Infants whose cord clamping occurred later than 60 seconds after birth had a higher rate of **neonatal jaundice** requiring **phototherapy**.^[18]

Delayed clamping is not recommended as a response to cases where the newborn is not breathing well and needs resuscitation. Rather, the recommendation is instead to immediately clamp and cut the cord and perform **cardiopulmonary resuscitation**.^[22] The umbilical cord pulsating is not a guarantee that the baby is receiving enough oxygen.^[23]

Umbilical nonseverance

Some parents choose to omit cord severance entirely, a practice called “**lotus birth**” or umbilical nonseverance. The entire intact umbilical cord is allowed to dry and separates on its own (typically on the 3rd day after birth), falling off and leaving a healed umbilicus.^[24]

Umbilical cord catheterization

As the umbilical vein is directly connected to the central circulation, it can be used as a route for placement of a venous catheter for infusion and medication. The umbilical vein catheter is a reliable alternative to percutaneous peripheral or central venous catheters or intraosseous canulas and may be employed in resuscitation or intensive care of the newborn.

Blood sampling

From 24 to 34 weeks of gestation, when the fetus is typically viable, blood can be taken from the cord in order to test for abnormalities (particularly for **hereditary** conditions). This diagnostic **genetic test** procedure is known as **percutaneous umbilical cord blood sampling**.^[25]

1.2.2 Storage of cord blood

Main article: **Cord blood**

The blood within the umbilical cord, known as **cord blood**, is a rich and readily available source of primitive, **undifferentiated stem cells** (of type **CD34-positive** and **CD38-negative**). These cord blood cells can be used for **bone marrow transplant**.

Some parents choose to have this blood diverted from the baby’s umbilical blood transfer through early cord clamping and cutting, to freeze for long-term storage at a **cord blood bank** should the child ever require the cord blood stem cells (for example, to replace **bone marrow** destroyed when treating **leukemia**). This practice is controversial, with critics asserting that early cord blood withdrawal at the time of birth actually increases the likelihood of childhood disease, due to the high volume of blood taken (an average of 108ml) in relation to the baby’s total supply (typically 300ml).^[20] The **Royal College of Obstetricians and Gynaecologists** stated in 2006 that “there is still insufficient evidence to recommend directed commercial cord blood collection and stem-cell storage in low-risk families”.

The **American Academy of Pediatrics** has stated that cord blood banking for self-use should be discouraged (as most conditions requiring the use of stem cells will already exist in the cord blood), while banking for general use should be encouraged.^[26] In the future, cord blood-derived embryonic-like stem cells (CBEs) may be banked and matched with other patients, much like blood and transplanted tissues. The use of CBEs could potentially eliminate the ethical difficulties associated with **embryonic stem cells** (ESCs).^[27]

While the American Academy of Pediatrics discourages private banking except in the case of existing medical need, it also says that information about the potential benefits and limitations of cord blood banking and transplantation should be provided so that parents can make an informed decision.

In the United States, cord blood education has been supported by legislators at the federal and state levels. In 2005, the National Academy of Sciences published an **Institute of Medicine (IoM)** report which recommended that expectant parents be given a balanced perspective on their options for cord blood banking. In response to their constituents, state legislators across the country are intro-

ducing legislation intended to help inform physicians and expectant parents on the options for donating, discarding or banking lifesaving newborn stem cells. Currently 17 states, representing two-thirds of U.S. births, have enacted legislation recommended by the IoM guidelines.

The use of cord blood stem cells in treating conditions such as brain injury^[28] and Type 1 Diabetes^[29] is already being studied in humans, and earlier stage research is being conducted for treatments of stroke,^{[30][31]} and hearing loss.^[32]

Cord blood stored with private banks is typically reserved for use of the donor child only. In contrast, cord blood stored in public banks is accessible to anyone with a closely matching tissue type and demonstrated need. The use of cord blood from public banks is increasing. Currently it is used in place of a bone marrow transplant in the treatment of blood disorders such as leukemia, with donations released for transplant through one registry, Netcord.org,^[33] passing 1,000,000 as of January 2013. Cord blood is used when the patient cannot find a matching bone marrow donor; this “extension” of the donor pool has driven the expansion of public banks.

1.3 The umbilical cord in other animals

The umbilical cord in some mammals, including cows and sheep, contains two distinct umbilical veins. There is only one umbilical vein in the human umbilical cord.^[34]

In some animals, the mother will gnaw through the cord, thus separating the placenta from the offspring. The cord along with the placenta is often eaten by the mother, to provide nourishment and to dispose of tissues that would otherwise attract scavengers or predators. In chimpanzees, the mother leaves the cord in place and nurses her young with the cord and placenta attached until the cord dries out and separates naturally, within a day of birth, at which time the cord is discarded. (This was first documented by zoologists in the wild in 1974.^[35])

Some species of shark are viviparous and have an umbilical cord attached to their placenta. These sharks are the hammerheads, requiems and smoothhounds.^[36] However, these sharks are still classed as fish, largely because they breathe through gills.

Animals that lay eggs seem to have a false umbilical-cord that attaches the embryo and yolk together in much the same way.

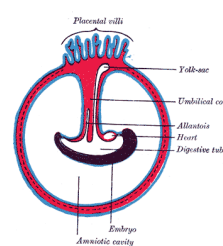
1.4 Other uses for the term “umbilical cord”

The term “umbilical cord” or just “umbilical” has also come to be used for other cords with similar functions, such as the hose connecting surface-supplied divers to their surface supply of air and/or heating, or space-suited astronauts to their spacecraft. Engineers sometimes use the term to describe a complex or critical cable connecting a component, especially when composed of bundles of conductors of different colors, thickness and types, terminating in a single multi-contact disconnect.

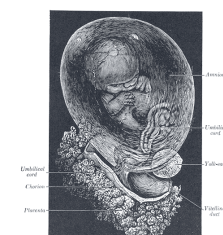
1.5 Cancer-causing toxins in human umbilical cords

In multiple American and international studies, cancer-causing chemicals have been found in the blood of umbilical cords. These originate from certain plastics, computer circuit boards, fumes and synthetic fragrances among others. Over 300 toxic chemicals have been found, including bisphenol A (BPA), tetrabromobisphenol A (TBBPA), Teflon-related perfluorooctanoic acid, galaxolide and synthetic musks among others.^[37] The studies in America showed higher levels in African Americans, Hispanic Americans and Asian Americans due, it is thought, to living in areas of higher pollution.^[38]

1.6 Additional images



- Diagram illustrating a later stage in the development of the umbilical cord.



- Fetus of about eight weeks, enclosed in the amnion. Magnified a little over two diameters

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1.9 External links

- Media related to **Umbilical cord** at Wikimedia Commons

Chapter 2

Latin

For other uses, see [Latin \(disambiguation\)](#).

“Roman language” redirects here. It is not to be confused with [Romance languages](#), [Romansh language](#), [Romanesco dialect](#), [Romanian language](#), or [Romani language](#).

Latin (Latin: *lingua latīna*, IPA: [ˈlɪŋɡˈa laˈtiːna]) is a classical language belonging to the Italic branch of the Indo-European languages. The Latin alphabet is derived from the Etruscan and Greek alphabets.

Latin was originally spoken in Latium, in the Italian Peninsula.^[3] Through the power of the Roman Republic, it became the dominant language, initially in Italy and subsequently throughout the Roman Empire. Vulgar Latin developed into the Romance languages, such as Italian, Portuguese, Spanish, French, and Romanian. Latin, Italian and French have contributed many words to the English language. Latin and Ancient Greek roots are used in theology, biology, and medicine.

By the late Roman Republic (75 BC), Old Latin had been standardised into Classical Latin. Vulgar Latin was the colloquial form spoken during the same time and attested in inscriptions and the works of comic playwrights like Plautus and Terence.^[4] Late Latin is the written language from the 3rd century, and Medieval Latin the language used from the 9th century to the Renaissance which used Renaissance Latin. Later, Early Modern Latin and Modern Latin evolved. Latin was used as the language of international communication, scholarship, and science until well into the 18th century, when it began to be supplanted by vernaculars. Ecclesiastical Latin remains the official language of the Holy See and the Roman Rite of the Catholic Church.

Today, many students, scholars and members of the Catholic clergy speak Latin fluently. It is taught in primary, secondary and postsecondary educational institutions around the world.^{[5][6]}

Latin is a highly inflected language, with three distinct genders, seven noun cases, four verb conjugations, four verb principal parts, six tenses, three persons, three moods, two voices, two aspects and two numbers.

2.1 Legacy

The language has been passed down through various forms.

2.1.1 Inscriptions

Some inscriptions have been published in an internationally agreed, monumental, multivolume series, the "*Corpus Inscriptionum Latinarum* (CIL)". Authors and publishers vary, but the format is about the same: volumes detailing inscriptions with a critical apparatus stating the provenance and relevant information. The reading and interpretation of these inscriptions is the subject matter of the field of epigraphy. About 270,000 inscriptions are known.

2.1.2 Literature



Julius Caesar's *Commentarii de Bello Gallico* is one of the most famous classical Latin texts of the Golden Age of Latin. The unvarnished, journalistic style of this patrician general has long been taught as a model of the urbane Latin officially spoken and written in the floruit of the Roman Republic.

The works of several hundred ancient authors who wrote in Latin have survived in whole or in part, in substantial works or in fragments to be analyzed in philology.

They are in part the subject matter of the field of **classics**. Their works were published in **manuscript** form before the invention of printing and are now published in carefully annotated printed editions, such as the Loeb Classical Library, published by Harvard University Press, or the Oxford Classical Texts, published by Oxford University Press.

Latin translations of modern literature such as *The Hobbit*, *Treasure Island*, *Robinson Crusoe*, *Paddington Bear*, *Winnie the Pooh*, *The Adventures of Tintin*, *Asterix*, *Harry Potter*, *Walter the Farting Dog*, *Le Petit Prince*, *Max and Moritz*, *How the Grinch Stole Christmas!*, *The Cat in the Hat*, and a book of fairy tales, “fabulae mirabiles,” are intended to garner popular interest in the language. Additional resources include phrasebooks and resources for rendering everyday phrases and concepts into Latin, such as Meissner’s Latin Phrasebook.

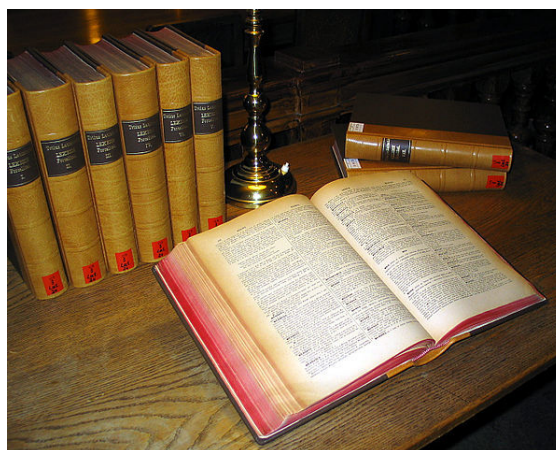
2.1.3 Linguistics

The Latin influence in English has been significant at all stages of its insular development. In the **Middle Ages**, borrowing from Latin occurred from ecclesiastical usage established by Saint Augustine of Canterbury in the 6th century or indirectly after the **Norman Conquest**, through the **Anglo-Norman** language. From the 16th to the 18th centuries, English writers cobbled together huge numbers of new words from Latin and Greek words, dubbed “**inkhorn terms**”, as if they had spilled from a pot of ink. Many of these words were used once by the author and then forgotten, but some useful ones survived, such as ‘imbibe’ and ‘extrapolate’. Many of the most common polysyllabic English words are of Latin origin through the medium of **Old French**.

The influence of Roman governance and **Roman technology** on the less-developed nations under Roman dominion made those nations adopt Latin phraseology in some specialized areas, such as science, technology, medicine, and law. For example, the **Linnaean system** of plant and animal classification was heavily influenced by *Historia Naturalis*, an encyclopedia of people, places, plants, animals, and things published by **Pliny the Elder**. Roman medicine, recorded in the works of such physicians as **Galen**, established that today’s **medical terminology** would be primarily derived from Latin and Greek words, the Greek being filtered through the Latin. Roman engineering had the same effect on **scientific terminology** as a whole. Latin law principles have survived partly in a long list of **Latin legal terms**.

A few international auxiliary languages have been heavily influenced by Latin. **Interlingua** is sometimes considered a simplified, modern version of the language. **Latino sine Flexione**, popular in the early 20th century, is Latin with its inflections stripped away, among other grammatical changes.

2.1.4 Education



A multivolume Latin dictionary in the University Library of Graz.

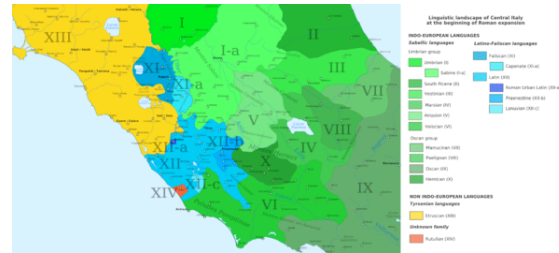
Throughout European history, an education in the classics was considered crucial for those who wished to join literate circles. **Instruction in Latin** is an essential aspect. In today’s world, a large number of Latin students in the US learn from *Wheelock’s Latin: The Classic Introductory Latin Course, Based on Ancient Authors*. This book, first published in 1956,^[7] was written by **Frederic M. Wheelock**, who received a PhD from Harvard University. *Wheelock’s Latin* has become the standard text for many American introductory Latin courses.

The **Living Latin** movement attempts to teach Latin in the same way that living languages are taught, as a means of both spoken and written communication. It is available at the Vatican and at some institutions in the US, such as the University of Kentucky and Iowa State University. The **British Cambridge University Press** is a major supplier of Latin textbooks for all levels, such as the **Cambridge Latin Course** series. It has also published a subseries of children’s texts in Latin by Bell & Forte, which recounts the adventures of a mouse called **Minimus**.

In the United Kingdom, the **Classical Association** encourages the study of antiquity through various means, such as publications and grants. The University of Cambridge,^[8] the **Open University**,^[9] a number of prestigious independent schools, for example **Eton** and **Harrow**, and **Via Facilis**,^[10] a London-based charity, run Latin courses. In the United States and in Canada, the **American Classical League** supports every effort to further the study of classics. Its subsidiaries include the **National Junior Classical League** (with more than 50,000 members), which encourages high school students to pursue the study of Latin, and the **National Senior Classical League**, which encourages students to continue their study of the classics into college. The league also sponsors the **National Latin Exam**. Classicist **Mary Beard** wrote in *The Times Literary Supplement* in 2006 that the reason for learning Latin is because of what was written in it.^[11]



Latin and Ancient Greek at Duke University, 2014.



The linguistic landscape of Central Italy at the beginning of Roman expansion

been recognised, each distinguished by subtle differences in vocabulary, usage, spelling, morphology and syntax. There are no hard and fast rules of classification; different scholars emphasise different features. As a result, the list has variants, as well as alternative names. In addition to the historical phases, **Ecclesiastical Latin** refers to the styles used by the writers of the **Roman Catholic Church** as well as by Protestant scholars from **Late Antiquity** onward.

After the Western Roman Empire fell in 476, and Germanic kingdoms took its place, the **Germanic people** adopted Latin as a language more suitable for legal and other formal uses.

2.1.5 Official status

Latin was or is the official language of European states:

-  **Holy See** – used in the diocese, with **Italian** being the official language of **Vatican City**
-  **Croatia** – Latin was the official language of **Croatian Parliament (Sabor)** from the 13th to the 19th century (1847). The oldest preserved records of the parliamentary sessions (Congregatio Regni totius Sclavonie generalis) – held in Zagreb (Zagabria), Croatia – date from 19 April 1273. An extensive **Croatian Latin** literature exists.
-  **Poland** – officially recognised and widely used^{[12][13][14][15]} between the 9th and 18th centuries, commonly used in foreign relations and popular as a second language among some of the nobility^[16]

2.2.1 Old Latin

Main article: **Old Latin**

The earliest known form of Latin is Old Latin, which was spoken from the **Roman Kingdom** to the middle of the **Roman Republic** period. It is attested both in inscriptions and in some of the earliest extant Latin literary works, such as the comedies of **Plautus** and **Terence**. The **Latin alphabet** was devised from the **Etruscan alphabet**. The writing later changed from an initial right-to-left or **boustrophedon**^{[17][18]} to a left-to-right script.^[19]

2.2.2 Classical Latin

Main article: **Classical Latin**

During the late republic and into the first years of the empire, a new Classical Latin arose, a conscious creation of the orators, poets, historians and other **literate men**, who wrote the great works of **classical literature**, which were taught in **grammar** and **rhetoric** schools. Today's instructional grammars trace their roots to such **schools**, which served as a sort of informal language academy dedicated to maintaining and perpetuating educated speech.^{[20][21]}

2.2 History

Main article: **History of Latin**

According to **Roman mythology**, Latin was established by a tribal people called the **Latini** before the **Trojan War**. A number of historical phases of the language have

2.2.3 Vulgar Latin

Main articles: [Vulgar Latin](#) and [Late Latin](#)

Philological analysis of Archaic Latin works, such as those of [Plautus](#), which contain snippets of everyday speech, indicates that a spoken language, Vulgar Latin (*sermo vulgi* (“the speech of the masses”) by [Cicero](#)), existed at the same time as the literate Classical Latin. The informal language was rarely written, so philologists have been left with only individual words and phrases cited by classical authors and those found as graffiti.^[22]

As it was free to develop on its own, there is no reason to suppose that the speech was uniform either diachronically or geographically. On the contrary, romanised European populations developed their own dialects of the language.^[23] The [Decline of the Roman Empire](#) meant a deterioration in educational standards that brought about Late Latin, a postclassical stage of the language seen in Christian writings of the time. It was more in line with the everyday speech not only because of a decline in education but also because of a desire to spread the word to the masses.

Despite the dialect variation (which is found in any widespread language) the languages of Spain, France, Portugal, and Italy retained a remarkable unity in phonological forms and developments, bolstered by the stabilising influence of their common Christian (Roman Catholic) culture. It was not until the [Moorish conquest of Spain](#) in 711 cut off communications between the major Romance regions that the languages began to diverge seriously.^[24] The Vulgar Latin dialect that would later become [Romanian](#) diverged somewhat more from the other varieties, as it was largely cut off from the unifying influences in the western part of the Empire.

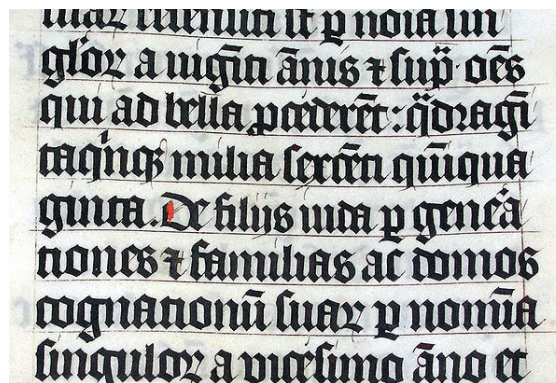
One way to determine whether a Romance language feature was in Vulgar Latin is to compare it with its parallel in Classical Latin. If it was not preferred in Classical Latin, then it most likely came from the invisible contemporaneous Vulgar Latin. For example, Romance “horse” (cavallo/cheval/caballo/cavalo) came from Latin *caballus*. However, Classical Latin used *equus*. *Caballus* therefore was most likely the spoken form (*slang*).^[25]

Vulgar Latin began to diverge into distinct languages by the 9th century at the latest, when the earliest extant Romance writings begin to appear. They were, throughout the period, confined to everyday speech, as Medieval Latin was used for writing.

2.2.4 Medieval Latin

Main article: [Medieval Latin](#)

Medieval Latin is the written Latin in use during that portion of the postclassical period when no corresponding Latin vernacular existed. The spoken language had



The Latin Malmesbury Bible from 1407.

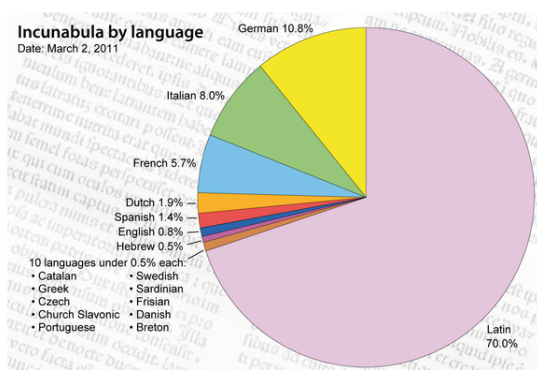
developed into the various incipient Romance languages; however, in the educated and official world Latin continued without its natural spoken base. Moreover, this Latin spread into lands that had never spoken Latin, such as the Germanic and Slavic nations. It became useful for international communication between the member states of the [Holy Roman Empire](#) and its allies.

Without the institutions of the Roman empire that had supported its uniformity, medieval Latin lost its linguistic cohesion: for example, in classical Latin *sum* and *eram* are used as auxiliary verbs in the perfect and pluperfect passive, which are compound tenses. Medieval Latin might use *fui* and *fuera* instead.^[26] Furthermore, the meanings of many words have been changed and new vocabularies have been introduced from the vernacular. Identifiable individual styles of classically incorrect Latin prevail.^[26]

2.2.5 Renaissance Latin

Main article: [Renaissance Latin](#)

The [Renaissance](#) briefly reinforced the position of Latin



Most 15th century printed books (*incunabula*) were in Latin, with the vernacular languages playing only a secondary role.^[27]

as a spoken language by its adoption by the Renaissance Humanists. Often led by members of the clergy, they were shocked by the accelerated dismantling of the ves-

tiges of the classical world and the rapid loss of its literature. They strove to preserve what they could and restore Latin to what it had been and introduced the practice of producing revised editions of the literary works that remained by comparing surviving manuscripts. They corrected Medieval Latin out of existence no later than the 15th century and replaced it with more correct versions supported by the scholars of the rising universities, who attempted, by scholarship, to discover what the classical language had been.

2.2.6 New Latin

Main article: [New Latin](#)

During the Early Modern Age, Latin still was the most important language of culture in Europe. Therefore, until the end of the 17th century the majority of books and almost all diplomatic documents were written in Latin. Afterwards, most diplomatic documents were written in French and later just native or other languages.

2.2.7 Contemporary Latin

Main article: [Contemporary Latin](#)

The largest organisation that retains Latin in official and



The signs at Wallsend Metro station are in English and Latin as a tribute to Wallsend's role as one of the outposts of the Roman Empire.

quasi-official contexts is the Catholic Church. Latin re-

mains the language of the **Roman Rite**; the **Tridentine Mass** is celebrated in Latin. Although the **Mass of Paul VI** is usually celebrated in the local **vernacular language**, it can be and often is said in Latin, in part or whole, especially at multilingual gatherings. It is the official language of the **Holy See**, the primary language of its **public journal**, the *Acta Apostolicae Sedis*, and the working language of the **Roman Rota**. **Vatican City** is also home to the world's only **automatic teller machine** that gives instructions in Latin.^[28] In the **pontifical universities** post-graduate courses of **Canon law** are taught in Latin, and papers are written in the same language.

In the **Anglican Church**, after the publication of the *Book of Common Prayer* of 1559, a Latin edition was published in 1560 for use at universities such as **Oxford** and the leading "public schools" (**English private academies**), where the liturgy was still permitted to be conducted in Latin^[29] and there have been several Latin translations since. Most recently, a Latin edition of the 1979 USA Anglican Book of Common Prayer has appeared.^[30]

Some films of ancient settings, such as *Sebastiane* and *The Passion of the Christ*, have been made with dialogue in Latin for the sake of realism. Occasionally, Latin dialogue is used because of its association with religion or philosophy, in such film/television series as *The Exorcist* and *Lost* ("Jughead"). Subtitles are usually shown for the benefit of those who do not understand Latin. There are also songs written with Latin lyrics. The libretto for the opera-oratorio *Oedipus rex* (opera) by Igor Stravinsky is in Latin.

Switzerland adopts the country's Latin short name *Helvetia* on coins and stamps since there is no room to use all of the nation's **four official languages**. For a similar reason, it adopted the international vehicle and internet code **CH**, which stands for *Confoederatio Helvetica*, the country's full Latin name.



The polyglot European Union has adopted Latin names in the logos of some of its institutions for the sake of linguistic compromise, an "ecumenical nationalism" common to most of the continent and as a sign of the continent's heritage (such as the EU Council: Consilium)

Many organizations today have Latin mottos, such as "Semper paratus" (always ready), the motto of the United States Coast Guard, and "Semper fidelis" (always faith-

ful), the motto of the **United States Marine Corps**. Several of the states of the United States also have Latin mottos, such as “Qui transtulit sustinet” (“He who transplanted still sustains”), the state motto of **Connecticut**; “Ad astra per aspera” (“To the stars through hardships”), that of **Kansas**; “Si quaeris peninsulam amoenam, circumspice” (“If you seek a pleasant peninsula, look about you”), that of **Michigan**; “Salus populi suprema lex esto” (“The health of the people should be the highest law”), that of **Missouri**; “Esse quam videri” (To be rather than to seem), that of **North Carolina**; “Sic semper tyrannis” (Thus always for tyrants), that of **Virginia**; and “Montani semper liberi” (Mountaineers are always free), that of **West Virginia**. Another Latin motto is “Per ardua ad astra” (Through adversity/struggle to the stars), the motto of the **Royal Air Force (RAF)**. Some schools adopt Latin mottos, for example **Harvard University**’s motto is “Veritas” meaning (truth). Veritas was the goddess of truth, a daughter of Saturn, and the mother of Virtue.

Similarly **Canada**’s motto “A mari usque ad mare” (from sea to sea) and most provincial mottos are also in Latin (**British Columbia**’s is Splendor Sine Occasu (splendor without diminishment)).

Occasionally, some media outlets broadcast in Latin, which is targeted at enthusiasts. Notable examples include **Radio Bremen** in **Germany**, **YLE radio** in **Finland**, and **Vatican Radio & Television**, all of which broadcast news segments and other material in Latin.^[31]

There are many websites and forums maintained in Latin by enthusiasts. The **Latin Wikipedia** has more than 100,000 articles written in Latin.

Latin is taught in many high schools, especially in Europe and the Americas. It is most common in **British public schools** and **grammar schools**, the **Italian liceo classico** and **liceo scientifico**, the **German Humanistisches Gymnasium** and the **Dutch gymnasium**. In the **United States**, it is taught in **Baltimore City College**, **Boston Latin Academy**, **Boston Latin School**, **Brooklyn Latin School**, **Central High School of Philadelphia**, **English High School of Boston**, **Norwell High School (Massachusetts)**, and **Oak Hall School**.

2.3 Phonology

Main article: [Latin spelling and pronunciation](#)

No inherited verbal knowledge of the ancient pronunciation of Latin exists so it must be reconstructed. Among the data used for reconstruction are explicit statements about pronunciation by ancient authors, misspellings, puns, ancient etymologies, and the spelling of Latin loanwords in other languages.^[32]

2.3.1 Consonants

The consonant **phonemes** of Classical Latin are shown in the following table:^[33]

In Old and Classical Latin, the Latin alphabet had no distinction between **uppercase** and **lowercase**, and the letters ⟨J U W⟩ did not exist. In place of ⟨J U⟩, ⟨I V⟩ were used. ⟨I V⟩ represented both vowels and consonants. Most of the letterforms were similar to modern uppercase, as can be seen in the inscription from the Colosseum shown at the top of the article.

The spelling systems used in Latin dictionaries and modern editions of Latin texts, however, normally use ⟨i u⟩ in place of Classical-era ⟨i v⟩. Some systems use ⟨j v⟩ for the consonant sounds /j w/ except in the combinations ⟨gu su qu⟩ for which ⟨v⟩ is never used.

Some notes concerning the mapping of Latin phonemes to English graphemes are given below:

Doubled consonants in Latin are pronounced long. In English, consonants are pronounced double only between two words or **morphemes**, as in *unnamed*, which has a doubled /nn/ like the *nn* in Latin *annus*.

2.3.2 Vowels

Simple vowels

In Classical Latin, the letter ⟨U⟩ was written as ⟨V⟩ even if it was used as a vowel. ⟨Y⟩ was adopted to represent **upsilon** in loanwords from Greek, but it was pronounced like ⟨u⟩ and ⟨i⟩ by some speakers. It was also used in native Latin words by confusion with Greek words of similar meaning, such as *sylva* and ὕλη.

Classical Latin distinguished between **long** and **short** vowels. Then, long vowels, except for ⟨I⟩, were frequently marked using the **apex**, which was sometimes similar to an **acute accent** ⟨Á Ê Ó Ý Ý⟩. Long /i:/ was written using a taller version of ⟨I⟩, called *i longa* “long I”: ⟨Ī⟩. In modern texts, long vowels are often indicated by a **macron** ⟨ā ē ī ō ū⟩, and short vowels are usually unmarked except when it is necessary to distinguish between words, when they are marked with a **breve**: ⟨ă ě ĭ ă ŭ⟩.

Long vowels in Classical Latin were pronounced with a different quality from short vowels and also were longer. The difference is described in table below:

A vowel and ⟨m⟩ at the end of a word, or a vowel and ⟨n⟩ before ⟨s⟩ or ⟨f⟩, was long and **nasal**, as in *monstrum* /mō:strū:/.

Diphthongs

Classical Latin had several **diphthongs**. The two most common were ⟨ae au⟩. ⟨oe⟩ was fairly rare, and ⟨ui eu ei ou⟩ were very rare, at least in native Latin words.^[36]

The sequences sometimes did not represent diphthongs. ⟨ae⟩ and ⟨oe⟩ also represented a sequence of two vowels in different syllables in *aēnus* [a'e:.nəs] “of bronze” and *coēpit* [kə'e:.pit] “began”, and ⟨au ui eu ei ou⟩ represented sequences of two vowels or of a vowel and one of the semivowels /j w/, in *cavē* ['ka.we:] “beware!”, *cuius* ['kʊj.jəs] “whose”, *monuī* ['mɔn.ʊ.i:] “I warned”, *solvī* ['sɔl.wi:] “I released”, *dēlēvī* [de:'le:.wi:] “I destroyed”, *eius* ['ej.jəs] “his”, and *novus* ['nɔ.wəs] “new”.

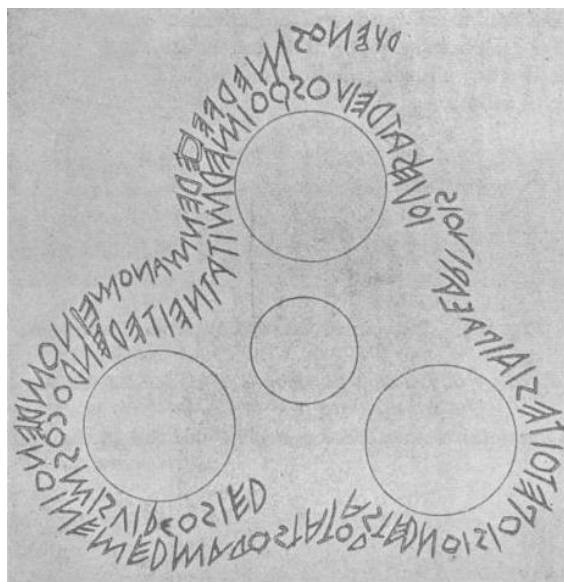
Old Latin had more diphthongs, but most of them changed into long vowels in Classical Latin. The Old Latin diphthong ⟨ai⟩ and the sequence ⟨āi⟩ became Classical ⟨ae⟩. Old Latin ⟨oi⟩ and ⟨ou⟩ changed to Classical ⟨k⟩, except in a few words whose ⟨oi⟩ became Classical ⟨oe⟩. These two developments sometimes occurred in different words from the same root: for instance, Classical *poena* “punishment” and *pūnīre* “to punish”.^[36] Early Old Latin ⟨ei⟩ usually changed to Classical ⟨ī⟩.^[37]

In Vulgar Latin and the Romance languages, ⟨ae au oe⟩ merged with ⟨e o ē⟩. A similar pronunciation also existed during the Classical Latin period for less-educated speakers.^[36]

2.4 Orthography

Main article: [Latin alphabet](#)

Latin was written in the Latin alphabet, derived from



The *Duenos Inscription*, from the 6th century BC, is one of the earliest known Old Latin texts.

the Old Italic script, which was in turn drawn from the Greek alphabet and ultimately the Phoenician alphabet.^[38] This alphabet has continued to be used over the centuries as the script for the Romance, Celtic, Germanic, Baltic, Finnic and many Slavic languages (Polish, Slovak, Slovene, Croatian and Czech), and it has been

adopted by many languages around the world, including Vietnamese, the Austronesian languages, many Turkic languages, and most languages in sub-Saharan Africa, the Americas, and Oceania, making it by far the world's single most widely used writing system.

The number of letters in the Latin alphabet has varied. When it was first derived from the Etruscan alphabet, it contained only 21 letters.^[39] Later, *G* was added to represent /g/, which had previously been spelled *C*, and *Z* ceased to be included in the alphabet, as the language then had no voiced alveolar fricative.^[40] The letters *Y* and *Z* were later added to represent Greek letters, *upsilon* and *zeta* respectively, in Greek loanwords.^[40]

W was created in the 11th century from *VV*. It represented /w/ in Germanic languages, not Latin, which still uses *V* for the purpose. *J* was distinguished from the original *I* only during the late Middle Ages, as was the letter *U* from *V*.^[40] Although some Latin dictionaries use *J*, it is rarely used for Latin text, as it was not used in classical times, but many other languages use it.

Classical Latin did not contain sentence punctuation, letter case,^[41] or interword spacing, but apices were sometimes used to distinguish length in vowels and the *interpunct* was used at times to separate words. The first line of Catullus 3, originally written as

LŪGĒTEÓVENERĒSCVPÍDINÉSQVE
 (“Mourn, O Venuses and Cupids”)

or with interpunct as

LŪGĒTE·Ó·VENERĒS·CVPÍDINÉSQVE

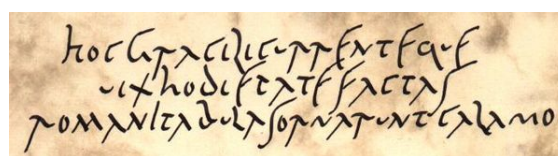
•

would be rendered in a modern edition as

Lugete, o Veneres Cupidinesque

or with macrons

Lūgēte, ō Venerēs Cupīdinēsque.



A replica of the Old Roman Cursive inspired by the *Vindolanda tablets*, the oldest surviving handwritten documents in Britain.

The Roman cursive script is commonly found on the many wax tablets excavated at sites such as forts, an especially extensive set having been discovered at Vindolanda on Hadrian's Wall in Britain. Curiously enough, most of the *Vindolanda tablets* show spaces between words, but spaces were avoided in monumental inscriptions from that era.

2.4.1 Alternate scripts

Occasionally, Latin has been written in other scripts:

- The disputed **Praeneste fibula** is a 7th-century BC pin with an Old Latin inscription written using the Etruscan script.
- The rear panel of the early 8th-century **Franks Casket** has an inscription that switches from **Old English** in **Anglo-Saxon runes** to Latin in Latin script and to Latin in runes.

2.5 Grammar

Main articles: **Latin grammar** and **Latin syntax**

Latin is a **synthetic, fusional language** in the terminology of linguistic typology. In more traditional terminology, it is an inflected language, but typologists are apt to say “inflecting”. Words include an objective semantic element and markers specifying the grammatical use of the word. The fusion of root meaning and markers produces very compact sentence elements: *amō*, “I love,” is produced from a semantic element, *ama-*, “love,” to which *-ō*, a first person singular marker, is suffixed.

The grammatical function can be changed by changing the markers: the word is “inflected” to express different grammatical functions, but the semantic element does not change. (Inflection uses affixing and infixing. Affixing is prefixing and suffixing. Latin inflections are never prefixed.)

For example, *amābit*, “he or she or it will love”, is formed from the same stem, *amā-*, to which a future tense marker, *-bi-*, is suffixed, and a third person singular marker, *-t*, is suffixed. There is an inherent ambiguity: *-t* may denote more than one grammatical category: masculine, feminine, or neuter gender. A major task in understanding Latin phrases and clauses is to clarify such ambiguities by an analysis of context. All natural languages contain ambiguities of one sort or another.

The inflections express **gender**, **number**, and **case** in **adjectives**, **nouns**, and **pronouns**, a process called **declension**. Markers are also attached to fixed stems of verbs, to denote **person**, **number**, **tense**, **voice**, **mood**, and **aspect**, a process called **conjugation**. Some words are uninflected and undergo neither process, such as adverbs, prepositions, and interjections.

2.5.1 Nouns

Main article: **Latin declension**

A regular Latin noun belongs to one of five main declensions, a group of nouns with similar inflected forms. The

declensions are identified by the genitive singular form of the noun. The first declension, with a predominant ending letter of *a*, is signified by the genitive singular ending of *-ae*. The second declension, with a predominant ending letter of *o*, is signified by the genitive singular ending of *-i*. The third declension, with a predominant ending letter of *i*, is signified by the genitive singular ending of *-is*. The fourth declension, with a predominant ending letter of *u*, is signified by the genitive singular ending of *-ūs*. The fifth declension, with a predominant ending letter of *e*, is signified by the genitive singular ending of *-ei*.

There are seven Latin noun cases, which also apply to adjectives and pronouns and mark a noun’s syntactic role in the sentence by means of inflections. Thus, **word order** is not as important in Latin as it is in English, which is less inflected. The general structure and word order of a Latin sentence can therefore vary. The cases are as follows:

1. **Nominative** – used when the noun is the **subject** or a **predicate nominative**. The thing or person acting: the **girl** ran: *puella cucurrit*, or *cucurrit puella*
2. **Genitive** – used when the noun is the possessor of or connected with an object: “the horse of the man”, or “the man’s horse”; in both instances, the word *man* would be in the **genitive case** when it is translated into Latin). It also indicates the **partitive**, in which the material is quantified: “a group of people”; “a number of gifts”: *people* and *gifts* would be in the genitive case). Some nouns are genitive with special verbs and adjectives: The cup is full of **wine**. *Poculum plenum vīnī est*. The master of the **slave** had beaten him. *Dominus servī eum verberāverat*.
3. **Dative** – used when the noun is the indirect object of the sentence, with special verbs, with certain prepositions, and if it is used as agent, reference, or even possessor: The merchant hands the **stola to the woman**. *Mercātor fēminae stolam trādit*.)
4. **Accusative** – used when the noun is the direct object of the subject and as the object of a preposition demonstrating place to which.: The man killed **the boy**. *Vir necāvit puerum*.
5. **Ablative** – used when the noun demonstrates separation or movement from a source, cause, **agent** or **instrument** or when the noun is used as the object of certain prepositions; adverbial: You walked **with the boy**. *cum puerō ambulāvistī*.
6. **Vocative** – used when the noun is used in a direct address. The vocative form of a noun is often the same as the nominative, but exceptions include second-declension nouns ending in *-us*. The *-us* becomes an *-e* in the vocative singular. If it ends in *-ius* (such as *filius*), the ending is just *-ī* (*filī*), as distinct from the nominative plural (*filī*) in the vocative singular: “**Master!**” shouted the slave. “**Domine!**” *clāmāvit servus*.

7. **Locative** – used to indicate a location (corresponding to the English “in” or “at”). It is far less common than the other six cases of Latin nouns and usually applies to cities and small towns and islands along with a few common nouns, such as the word *domus*, house. In the singular of the first and second declensions, its form coincides with the genitive (*Roma* becomes *Romae*, “in Rome”). In the plural of all declensions and the singular of the other declensions, it coincides with the ablative (*Athēnae* becomes *Athēnīs*, “at Athens”). In the fourth-declension word *domus*, the locative form, *domī* (“at home”) differs from the standard form of all other cases.

Latin lacks both definite and indefinite articles so *puer currit* can mean either “the boy is running” or “a boy is running”.

2.5.2 Adjectives

Main article: [Latin declension](#)

There are two types of regular Latin adjectives: first- and second- declension and third-declension. They are so-called because their forms are similar or identical to first- and second-declension and third-declension nouns, respectively. Latin adjectives also have comparative (more --, *-er*) and superlative (most --, *-est*) forms. There are also a number of Latin participles.

Latin numbers are sometimes declined. See *Numbers* below.

First- and second-declension adjectives

First- and second-declension adjectives are declined like first-declension nouns for the feminine forms and like second-declension nouns for the masculine and neuter forms. For example, for *mortuus*, *mortua*, *mortuum* (dead), *mortua* is declined like a regular first-declension noun (such as *puella* (girl)), *mortuus* is declined like a regular second-declension masculine noun (such as *dominus* (lord, master)), and *mortuum* is declined like a regular second-declension neuter noun (such as *auxilium* (help)).

First- and second-declension -er adjectives

Some first- and second-declension adjectives have an *-er* as the masculine nominative singular form and are declined like regular first- and second-declension adjectives. Some but not all adjectives keep the *e* for all of the forms.

Third-declension adjectives

Third-declension adjectives are mostly declined like normal third-declension nouns, with a few exceptions. In the

plural nominative neuter, for example, the ending is *-ia* (*omnia* (all, everything)), and for third-declension nouns, the plural nominative neuter ending is *-a* or *-ia* (*capita* (heads), *animalia* (animals)) They can have one, two or three forms for the masculine, feminine, and neuter nominative singular.

Participles

Latin participles, like English participles, are formed from a verb. There are a few main types of participles: Present Active Participles, Perfect Passive Participles, Future Active Participles, and Future Passive Participles.

2.5.3 Prepositions

Latin sometimes uses prepositions, depending on the type of prepositional phrase being used. Prepositions can take two cases for their object: the accusative (“apud puerum” (with the boy), with “puerum” being the accusative form of “puer”, boy) and the ablative (“sine puero” (without the boy), “puero” being the ablative form of “puer”, boy).

2.5.4 Verbs

Main article: [Latin conjugation](#)

A regular verb in Latin belongs to one of four main conjugations. A conjugation is “a class of verbs with similar inflected forms.”^[42] The conjugations are identified by the last letter of the verb’s present stem. The present stem can be found by omitting the *-re* (*-rī* in deponent verbs) ending from the present infinitive form. The infinitive of the first conjugation ends in *-ā-re* or *-ā-rī* (active and passive respectively): *amāre*, “to love,” *hortārī*, “to exhort”; of the second conjugation by *-ē-re* or *-ē-rī*: *monēre*, “to warn,” *verērī*, “to fear;” of the third conjugation by *-ere*, *-ī*: *dūcere*, “to lead,” *ūtī*, “to use”; of the fourth by *-ī-re*, *-ī-rī*: *audīre*, “to hear,” *experīrī*, “to attempt”.^[43]

Irregular verbs may not follow the types or may be marked in a different way. The “endings” presented above are not the suffixed infinitive markers. The first letter in each case is the last of the stem so the conjugations are also called a-conjugation, e-conjugation and i-conjugation. The fused infinitive ending is *-re* or *-rī*. Third-conjugation stems end in a consonant: the consonant conjugation. Further, there is a subset of the third conjugation, the i-stems, which behave somewhat like the fourth conjugation, as they are both i-stems, one short and the other long.^[43] The stem categories descend from [Indo-European](#) and can therefore be compared to similar conjugations in other Indo-European languages.

There are six general tenses in Latin (present, imperfect, future, perfect, pluperfect and future perfect), three

moods (indicative, imperative and subjunctive, in addition to the infinitive, participle, gerund, gerundive and supine), three persons (first, second and third), two numbers (singular and plural), two voices (active and passive) and three aspects (perfective, imperfective, and stative). Verbs are described by four principal parts:

1. The first principal part is the first-person singular, present tense, indicative mood, active voice form of the verb. If the verb is impersonal, the first principal part will be in the third-person singular.
2. The second principal part is the present infinitive active.
3. The third principal part is the first-person singular, perfect indicative active form. Like the first principal part, if the verb is impersonal, the third principal part will be in the third-person singular.
4. The fourth principal part is the supine form, or alternatively, the nominative singular, perfect passive participle form of the verb. The fourth principal part can show one gender of the participle or all three genders (-us for masculine, -a for feminine and -m for neuter) in the nominative singular. The fourth principal part will be the future participle if the verb cannot be made passive. Most modern Latin dictionaries, if they show only one gender, tend to show the masculine; but many older dictionaries instead show the neuter, as it coincides with the supine. The fourth principal part is sometimes omitted for intransitive verbs, but strictly in Latin, they can be made passive if they are used impersonally, and the supine exists for such verbs.

There are six tenses in the Latin language. These are divided into two tense systems: the present system, which is made up of the present, imperfect and future tenses, and the perfect system, which is made up of the perfect, pluperfect and future perfect tenses. Each tense has a set of endings corresponding to the person and number referred to. Subject (nominative) pronouns are generally omitted for the first (*I, we*) and second (*you*) persons unless emphasis on the subject is desired.

The table below displays the common inflected endings for the indicative mood in the active voice in all six tenses. For the future tense, the first listed endings are for the first and second conjugations, and the second listed endings are for the third and fourth conjugations:

The future perfect endings are identical to the future forms of *sum* (with the exception of *erint*) and that the pluperfect endings are identical to the imperfect forms of *sum*.

Deponent verbs

Some Latin verbs are **deponent**, causing their forms to be in the passive voice but retain an active meaning: *hortor*,

hortārī, hortātus sum (to urge).

2.6 Vocabulary

As Latin is an Italic language, most of its vocabulary is likewise Italic, ultimately from the ancestral **Proto-Indo-European language**. However, because of close cultural interaction, the Romans not only adapted the Etruscan alphabet to form the Latin alphabet but also borrowed some **Etruscan** words into their language, including *persona* “mask” and *histrīo* “actor”.^[44] Latin also included vocabulary borrowed from **Oscan**, another Italic language.

After the **Fall of Tarentum** (272 BC), the Romans began hellenizing, or adopting features of Greek culture, including the borrowing of Greek words, such as *camera* (vaulted roof), *symbolum* (symbol), and *balineum* (bath).^[44] This hellenization led to the addition of “Y” and “Z” to the alphabet to represent Greek sounds.^[45] Subsequently the Romans transplanted **Greek art, medicine, science and philosophy** to Italy, paying almost any price to entice Greek skilled and educated persons to Rome and sending their youth to be educated in Greece. Thus, many Latin scientific and philosophical words were Greek loanwords or had their meanings expanded by association with Greek words, as *ars* (craft) and τέχνη.^[46]

Because of the Roman Empire’s expansion and subsequent trade with outlying European tribes, the Romans borrowed some northern and central European words, such as *beber* (beaver), of Germanic origin, and *bracae* (breeches), of Celtic origin.^[46] The specific dialects of Latin across Latin-speaking regions of the former Roman Empire after its fall were influenced by languages specific to the regions. The dialects of Latin evolved into different Romance languages.

During and after the adoption of Christianity into Roman society, Christian vocabulary became a part of the language, either from Greek or Hebrew borrowings or as Latin neologisms.^[47] Continuing into the Middle Ages, Latin incorporated many more words from surrounding languages, including **Old English** and other **Germanic languages**.

Over the ages, Latin-speaking populations produced new adjectives, nouns, and verbs by affixing or compounding meaningful segments.^[48] For example, the compound adjective, *omnipotens*, “all-powerful,” was produced from the adjectives *omnis*, “all”, and *potens*, “powerful”, by dropping the final *s* of *omnis* and concatenating. Often, the concatenation changed the part of speech, and nouns were produced from verb segments or verbs from nouns and adjectives.^[49]

2.7 Phrases

The phrases are mentioned with **accents** to show where to stress.^[50] In Latin, most words are stressed at the second-last (penultimate) **syllable**, called in Latin *paenultima* or *syllaba paenultima*.^[51] A few words are stressed at the third-last syllable, called in Latin *antepaenultima* or *syllaba antepaenultima*.^[51]

sálve to one person / **salvéte** to more than one person - hello

áve to one person / **avéte** to more than one person - greetings

vále to one person / **valéte** to more than one person - goodbye

cúra ut váleas - take care

exoptátus to male / **exoptáta** to female, **optátus** to male / **optáta** to female, **grátus** to male / **gráta** to female, **accéptus** to male / **accépta** to female - welcome

quómodo váles?, ut váles? - how are you?

béne - good

amabo te - please

béne váleo - I'm fine

mále - bad

mále váleo - I'm not good

quáeso ([ˈkwajso]/[ˈkwe:so]) - please

íta, íta est, íta véro, sic, sic est, étiam - yes

non, minime - no

grátias tíbi, grátias tíbi ágo - thank you

mágnas grátias, mágnas grátias ágo - many thanks

máximas grátias, máximas grátias ágo, ingéntes grátias ágo - thank you very much

accípe sis to one person / **accípíte sítis** to more than one person, **libénter** - you're welcome

qua aetáte es? - how old are you?

25 ánnos nátus to male / **25 ánnos náta** to female - 25 years old

loquerísne ... - do you speak ...

- **Latíne?** - Latin?
- **Gráece?** ([ˈgrajke]/[ˈgre:ke]) - Greek?
- **Ánglice?** ([ˈaŋlike]) - English?
- **Italiáne?** - Italian?
- **Gallice?** - French?
- **Hispánice?** - Spanish?
- **Lusitánice?** - Portuguese?
- **Theodísce?** ([teo'diske]) - German?
- **Sínice?** - Chinese?

- **Japónice?** ([ja'po:nike]) - Japanese?
- **Coreane?** - Korean?
- **Arábice?** - Arabic?
- **Pérsice?** - Persian?
- **Indice?** - Hindi?
- **Rússice?** - Russian?

úbi latrína est? - where is the toilet?

ámo te / te ámo - I love you

2.8 Numbers

In ancient times, numbers in Latin were written only with letters. Today, the numbers can be written with the **Arabic numbers** as well as with **Roman numerals**. The numbers 1, 2 and 3 and every whole hundred from 200 to 900 are declined as nouns and adjectives, with some differences.

The numbers from 4 to 100 often do not change their endings.

2.9 Example text

Commentarii de Bello Gallico, also called *De Bello Gallico* (*The Gallic War*), written by **Gaius Julius Caesar**, begins with the following passage:

Gallia est omnis divisa in partes tres, quarum unam incolunt Belgae, aliam Aquitani, tertiam qui ipsorum lingua Celtae, nostra Galli appellantur. Hi omnes lingua, institutis, legibus inter se differunt. Gallos ab Aquitanis Garumna flumen, a Belgis Matrona et Sequana dividit. Horum omnium fortissimi sunt Belgae, propterea quod a cultu atque humanitate provinciae longissime absunt, minimeque ad eos mercatores saepe commeant atque ea quae ad effeminandos animos pertinent important, proximique sunt Germanis, qui trans Rhenum incolunt, quibuscum continenter bellum gerunt. Qua de causa Helvetii quoque reliquos Gallos virtute praecedunt, quod fere cotidianis proeliis cum Germanis contendunt, cum aut suis finibus eos prohibent aut ipsi in eorum finibus bellum gerunt. Eorum una pars, quam Gallos obtinere dictum est, initium capit a flumine Rhodano, continetur Garumna flumine, Oceano, finibus Belgarum; attingit etiam ab Sequanis et Helvetiis flumen Rhenum; vergit ad septentriones. Belgae ab extremis Galliae finibus oriuntur; pertinent ad inferiorem

partem fluminis Rheni; spectant in septentrionem et orientem solem. Aquitania a Garumna flumine ad Pyrenaeos montes et eam partem Oceani quae est ad Hispaniam pertinet; spectat inter occasum solis et septentriones.

2.10 See also

- Classical compound
- Classics
- Greek and Latin roots in English
- Hybrid word
- Latin mnemonics
- Latin school
- List of Greek and Latin roots in English
- List of Latin abbreviations
- List of Latin and Greek words commonly used in systematic names
- List of Latin phrases
- List of Latin translations of modern literature
- List of Latin words with English derivatives
- List of Latinised names
- Lorem ipsum
- Romanization (cultural)
- Toponymy
- Help:IPA for Latin

2.11 Notes

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- [12] Who only knows Latin can go across the whole Poland from one side to the other one just like he was at his own home, just like he was born there. So great happiness! I wish a traveler in England could travel without knowing any other language than Latin!, Daniel Defoe, 1728
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2.13 External links

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- "Latin Word Study Tool". *Perseus Hopper*. Tufts University. Identifies the grammatical functions of words entered. Online results.
- Aversa, Alan. "Latin Inflector". University of Arizona. Identifies the grammatical functions of all the words in sentences entered, using Perseus.
- "Latin Verb Conjugator". Verbix. Displays complete conjugations of verbs entered in first-person present singular form.
- "Online Latin Verb Conjugator". Displays conjugation of verbs entered in their infinitive form.
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- "Classical Language Toolkit" (CLTK). A Natural Language Processing toolkit for Python offering a variety of functionality for Latin and other classical languages.

2.13.2 Courses

- Latin Lessons (free online through the Linguistics Research Center at UT Austin)
- Free 47-Lesson Online Latin Course, Learnlangs
- Learn Latin Grammar, vocabulary and audio
- Latin Links and Resources, Compiled by Fr. Gary Coulter
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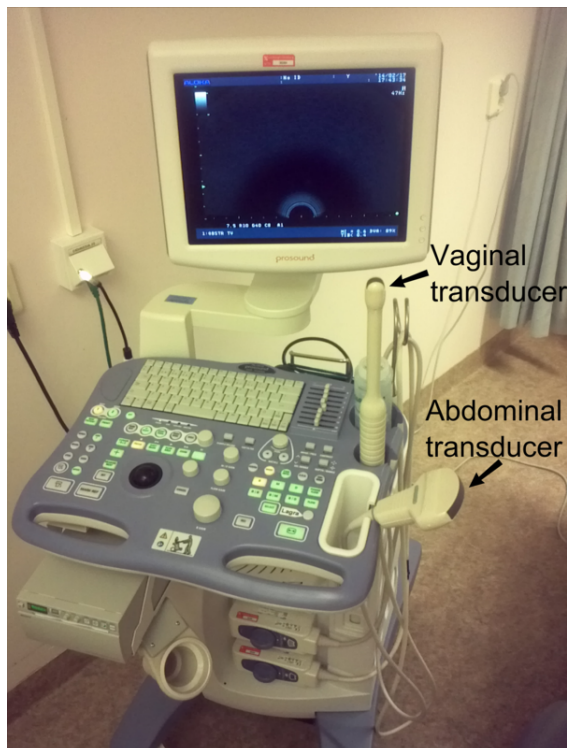
- [Ephemeris](#), online Latin newspaper
- [Nuntii Latini](#), from Finnish YLE Radio 1
- [News in Latin](#), Radio Bremen
- [Classics Podcasts in Latin and Ancient Greek](#), Haverford College
- [Latinum Latin Language course and Latin Language YouTube Index](#)

2.13.6 Latin language online communities

- [Grex Latine Loquentium](#) (Flock of those Speaking Latin)
- [Circulus Latinus Interretialis](#) (Internet Latin Circle)
- [Latinitas Foundation](#), at the Vatican

Chapter 3

Vaginal ultrasonography



Device for both vaginal and abdominal ultrasonography.

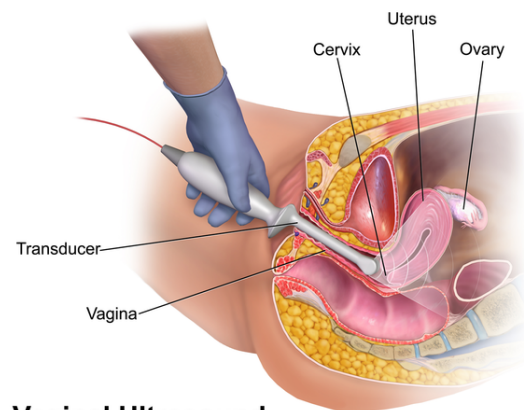
Vaginal ultrasonography is a medical ultrasonography that applies an ultrasound transducer (or “probe”) in the vagina to visualize organs within the pelvic cavity. It is also called transvaginal ultrasonography because the ultrasound waves go *across* the vaginal wall to study tissues beyond it.

3.1 Uses

Further information: gynecologic ultrasonography and obstetric ultrasonography

Vaginal ultrasonography is used both as a means of gynecologic ultrasonography and obstetric ultrasonography.

It is preferred over abdominal ultrasonography in the di-



Vaginal Ultrasound

Transvaginal ultrasonography procedure.

agnosis of ectopic pregnancy.^[1]

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Chapter 4

Allantois

Allantois (/əˈlæntɔɪs/; plural *allantoides* or *allantoises*) is a sac-like structure that forms part of a developing amniote's **conceptus** (which consists of all **embryonic** and extra-embryonic tissues). It helps the embryo exchange gases and handle liquid waste.

The allantois, along with the **amnion** and **chorion** (other embryonic membranes), identify humans, and other mammals, as **amniotes**. Other amniotes include reptiles, dinosaurs, and birds. Of the **vertebrates**, only **Ichthyopsidas** (fish and **amphibians**) lack this structure.

4.1 Function

This sac-like structure is primarily involved in **nutrition** and **excretion**, and is webbed with blood vessels. The function of the allantois is to collect liquid waste from the embryo, as well as to exchange gases used by the embryo.

4.1.1 In reptiles, birds, and monotremes

The structure first evolved in **reptiles** and **birds** as a reservoir for nitrogenous waste, and also as a means for oxygenation of the embryo. **Oxygen** is absorbed by the allantois through the **egg shell**.

4.1.2 In most marsupials

In most **marsupials**, the allantois is avascular, having no blood vessels, but still serves the purpose of storing nitrogenous (NH_3) waste. Also, most marsupial allantoises do not fuse with the **chorion**. An exception is the allantois of the **bandicoot**, which has a vasculature, and fuses with the chorion.

4.1.3 In placental mammals (Eutheria)

In **placental** mammals, the allantois is part of and forms an axis for the development of the **umbilical cord**.

- The **mouse** allantois consists of **mesodermal** tissue, which undergoes **vasculogenesis** to form the mature

umbilical artery and vein.^[1]

- The **human** allantois is an **endodermal evagination** of the developing **hindgut** which becomes surrounded by the **mesodermal** connecting stalk. The connecting stalk forms the umbilical vasculature. The allantois becomes the **urachus** which connects the fetal bladder to the yolk sac. The **urachus** removes nitrogenous waste from the fetal bladder.^[2] The allantois is **vestigial** and may regress, yet the homologous blood vessels persist as the umbilical arteries and veins connecting the embryo with the placenta.^[3]

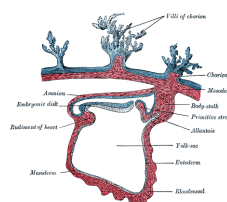
4.2 Clinical significance

During the third week of development, the allantois protrudes into the area of the **urogenital sinus**. Between the 5th and 7th week of development, the allantois will become the **urachus**, a duct between the bladder and the yolk sac. A patent allantois can result in **urachal cyst**.

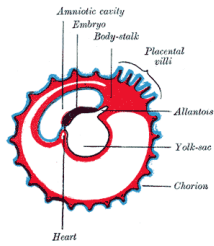
4.3 Etymology

The word comes from the **Greek** words **allanto-**, meaning **sausage**, and **eidos**, meaning **shape** or **similarity**.

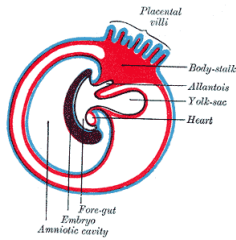
4.4 Additional images



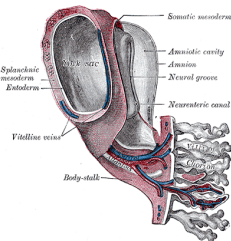
Section through the embryo.



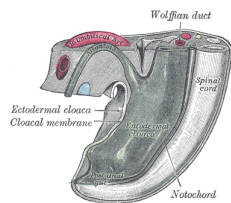
- Diagram showing later stage of allantoic development with commencing constriction of the yolk-sac.



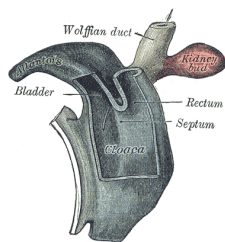
- Diagram showing the expansion of amnion and delimitation of the umbilicus.



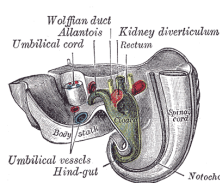
- Model of human embryo 1.3 mm. long.



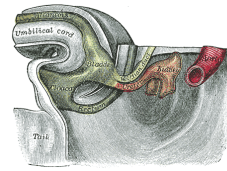
- Tail end of human embryo from fifteen to eighteen days old.



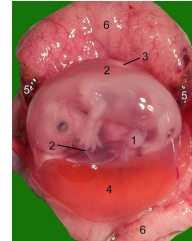
- Cloaca of human embryo from twenty-five to twenty-seven days old.



- Tail end of human embryo twenty-five to twenty-nine days old.



- Tail end of human embryo thirty-two to thirty-three days old.



- Opened uterus with cat fetus in mid-gestation: 1 umbilicus, 2 amnion, 3 allantois, 4 Yolk sac, 5 developing marginal hematoma, 6 maternal part of placenta (endometrium)



- Ultrasound of fetus showing urachus duct from bladder to the umbilicus.



- Ultrasound of fetus showing urachus duct from bladder to the umbilicus.



- Ultrasound of fetus showing urachus duct from bladder to the umbilicus.



- Ultrasound of fetus showing urachus duct from bladder to the umbilicus.



- Ultrasound of fetus showing urachus duct from bladder to the umbilicus.

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4.6 External links

- Diagram at University of Texas - Arlington

Chapter 5

Cord blood

Umbilical cord blood is **blood** that remains in the **placenta** and in the attached **umbilical cord** after **childbirth**. Cord blood is collected because it contains **stem cells**, which can be used to treat **hematopoietic** and **genetic disorders**.

5.1 Medical uses

Cord blood is used the same way that **hematopoietic stem cell transplantation** is used to reconstitute bone marrow following radiation treatment for various blood cancers, and for various forms of **anemia**.^{[1][2]} Its efficacy is similar as well.^[1]

5.2 Adverse effects

Adverse effects are similar to hematopoietic stem cell transplantation, namely **graft-versus-host disease** and the risk of severe infection while the immune system is reconstituted.^[1] There may be a higher risk of infection with cord blood compared with traditional HSCT, as cord blood is slower in generating immune cells.^[1]

5.3 Collection and storage

Umbilical cord blood is the blood left over in the placenta and in the umbilical cord after the birth of the baby. The cord blood is composed of all the elements found in whole blood. It contains red blood cells, white blood cells, plasma, platelets and is also rich in **hematopoietic stem cells**. There are several methods for collecting cord blood. The method most commonly used in clinical practice is the “closed technique”, which is similar to standard blood collection techniques. With this method, the technician **cannulates** the **vein** of the severed umbilical cord using a needle that is connected to a blood bag, and cord blood flows through the needle into the bag. On average, the closed technique enables collection of about 75 ml of cord blood.^[3]

Collected cord blood is **cryopreserved** and then stored

in a **cord blood bank** for future transplantation. Cord blood collection is typically depleted of red blood cells before cryopreservation to ensure high rates of stem cell recovery.^[4]

5.4 History

The first successful cord blood transplant (CBT) was done in 1988 in a child with **Fanconi anemia**.^[1] Early efforts to use CBT in adults led to mortality rates of about 50%, due somewhat to the procedure being done in very sick people, but perhaps also due to slow development of immune cells from the transplant.^[1] By 2013 30,000 CBT procedures had been performed and banks held about 600,000 units of cord blood.^[2]

5.5 Society and culture

5.5.1 Regulation

The **AABB** has generated accreditation standards for cord blood banking facilities.^[5]

In the United States, the **Food and Drug Administration** regulates any facility that stores cord blood; cord blood intended for use in the person from whom it came is not regulated, but cord blood for use in others is regulated as a drug and as a biologic.^[6] Several states also have regulations for cord blood banks.^[5]

In Europe, Canada, and Australia use of cord blood is regulated as well.^[5] In the **United Kingdom** the NHS Cord Blood Bank was set up in 1996 to collect, process, store and supply cord blood; it is a public cord blood bank and part of the NHS.^[7]

5.5.2 Private and public banks

A cord blood bank may be private (i.e. the blood is stored for and the costs paid by donor families) or public (i.e. stored and made available for use by unrelated donors). While public cord blood banking is widely supported, private cord banking is controversial in both the medical and

parenting community. Although umbilical cord blood is well-recognized to be useful for treating hematopoietic and genetic disorders, some controversy surrounds the collection and storage of umbilical cord blood by private banks for the baby's use. Only a small percentage of babies (estimated at between 1 in 1,000 to 1 in 200,000^[8]) ever use the umbilical cord blood that is stored. The American Academy of Pediatrics 2007 Policy Statement on Cord Blood Banking stated: "Physicians should be aware of the unsubstantiated claims of private cord blood banks made to future parents that promise to insure infants or family members against serious illnesses in the future by use of the stem cells contained in cord blood." and "private storage of cord blood as 'biological insurance' is unwise" unless there is a family member with a current or potential need to undergo a stem cell transplantation.^{[8][9]} The American Academy of Pediatrics also notes that the odds of using one's own cord blood is 1 in 200,000 while the Institute of Medicine says that only 14 such procedures have ever been performed.^[10] Private storage of one's own cord blood is unlawful in Italy and France, and it is also discouraged in some other European countries. The American Medical Association states "Private banking should be considered in the unusual circumstance when there exists a family predisposition to a condition in which umbilical cord stem cells are therapeutically indicated. However, because of its cost, limited likelihood of use, and inaccessibility to others, private banking should not be recommended to low-risk families."^[11] The American Society for Blood and Marrow Transplantation and the American Congress of Obstetricians and Gynecologists also encourage public cord banking and discourage private cord blood banking. Nearly all cord blood transfusions come from public banks, rather than private banks,^{[9][12]} partly because most treatable conditions can't use one's own cord blood.^{[8][13]} The World Marrow Donor Association and European Group on Ethics in Science and New Technologies states "The possibility of using one's own cord blood stem cells for regenerative medicine is currently purely hypothetical....It is therefore highly hypothetical that cord blood cells kept for autologous use will be of any value in the future" and "the legitimacy of commercial cord blood banks for autologous use should be questioned as they sell a service which has presently no real use regarding therapeutic options."^[14]

The American Academy of Pediatrics supports efforts to provide information about the potential benefits and limitations of cord blood banking and transplantation, so that parents can make an informed decision. In addition, the American College of Obstetricians and Gynecologists recommends that if a patient requests information on umbilical cord blood banking, balanced information should be given. Cord blood education is also supported by legislators at the federal and state levels. In 2005, the National Academy of Sciences published an Institute of Medicine (IoM) report titled "Establishing a National Cord Blood Stem Cell Bank Program".^[15]

In March 2004, the European Union Group on Ethics (EGE) has issued Opinion No.19^[16] titled *Ethical Aspects of Umbilical Cord Blood Banking*. The EGE concluded that "[t]he legitimacy of commercial cord blood banks for autologous use should be questioned as they sell a service, which has presently, no real use regarding therapeutic options. Thus they promise more than they can deliver. The activities of such banks raise serious ethical criticisms."^[16]

5.6 Research

Though uses of cord blood beyond blood and immunological disorders is speculative, some research has been done in other areas.^[17] Any such potential beyond blood and immunological uses is limited by the fact that cord cells are hematopoietic stem cells (which can differentiate only into blood cells), and not pluripotent stem cells (such as embryonic stem cells, which can differentiate into any type of tissue). Cord blood has been studied as a treatment for diabetes.^[18] However, apart from blood disorders, the use of cord blood for other diseases is not a routine clinical modality and remains a major challenge for the stem cell community.^{[17][18]}

Along with cord blood, Wharton's jelly and the cord lining have been explored as sources for mesenchymal stem cells (MSC),^[19] and as of 2015 had been studied in vitro, in animal models, and in early stage clinical trials for cardiovascular diseases,^[20] as well as neurological deficits, liver diseases, immune system diseases, diabetes, lung injury, kidney injury, and leukemia.^[21]

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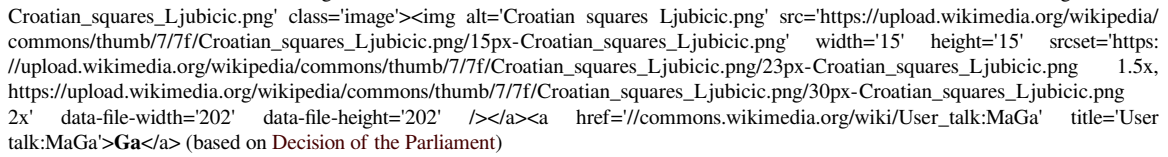
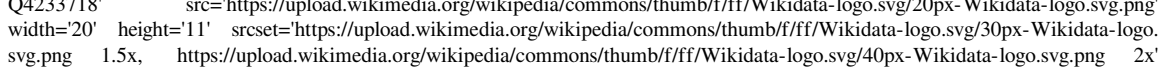
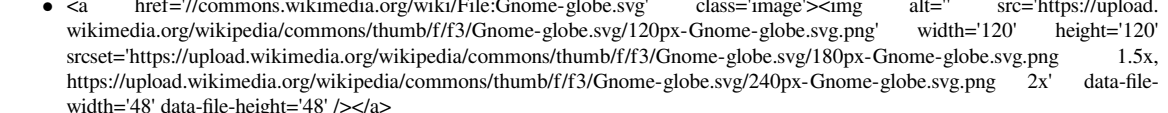
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Sporka, Gwernol, Tone, Antonio Di Dio, YurikBot, Wavelength, Sceptre, Wester, Stan2525, Hairy Dude, Brandmeister (old), Boldymbles, RussBot, Rubberbandman747, Petiatil, Pigman, Quintusdecimus, Curuinor, Stephenb, Argentino, Mithridates, Rintrah, Gaius Cornelius, Eleassar, Rsrikanth05, Member, Mark O'Sullivan, Shanel, NawlinWiki, Daniel563, Exit-enwiki, Wiki alf, BigCow, Complainer, Veledan, Ptcamn, Jaxl, Johann Wolfgang, Erise, GrumpyTroll, MonMan, Ashwinr, RazoriCE, AnotherLoophole, Lexicon, Nick, Isolani, Banes, Matticus78, Sdsouza, Mlouns, Rockero, Misza13, Yano, Raskolnikov The Penguin, Dbfirs, EEMIV, Eleusinian, BOT-Superzerocool, Barjazz, DeadEyeArrow, Bota47, DRosenbach, D-Day, Haemo, Botteville, MarkBrooks, Tonym88, Olthule, Daniel C, SFH, Paul Magnussen, 21655, Deville, Masatran, Zzuuz, Jsdruck, Lt-wiki-bot, BayerischerMann, Closedmouth, Spacebirdy, StevenAArmstrong, Fang Aili, Gulliveig, Enni84, JuJube, JoanneB, Fram, Scoutersig, Hayden120, Emc2, ManekiNeko, Nixer, Kaicarver, Che829, Allens, Kungfuadam, Rikimarun-enwiki, Philip Stevens, GrinBot-enwiki, Sbyrnes321, DVD R W, Jer ome, robot, Prvc, AndrewWTaylor, Mhardcastle, Sardanaphalus, Vanka5, Amalthea, SmackBot, YellowMonkey, Ashenai, Saravask, F, Haza-w, Estoy Aquí, Philx, Reedy, Tom Lougheed, KnowledgeOfSelf, Martin.Budden, Lagalag, Pkg, C.Fred, Ramdrake, Wegesrand, Blue520, Speight, Patrickneil, IainP, Baby Jenga, Delldot, Rojomoke, Jab843, David G Brault, Wakuran, BiT, Edgar181, Alex earlier account, IstvanWolf, Andyzo, Sebesta, Ogdred, Commander Keane bot, Richmeister, Peter Isotalo, Gilliam, Ohnoitsjamie, Titopao, Hmains, Betacommand, Skizzik, Chris kupka, Rmosler2100, Hraefen, Chris the speller, Wan726, Keegan, Persian

Poet Gal, Tito4000, Thumperward, Silly rabbit, SchiftyThree, Hibernian, Moshe Constantine Hassan Al-Silverburg, Jfsamper, Articulo1, Kaya-enwiki, Baronnet, DHN-bot-enwiki, Da Vynzi, William Allen Simpson, Darth Panda, CaveatLector, Gyrobo, Can't sleep, clown will eat me, Emrrans, Dr. Marcus Gossler, Ioscius, Skidude9950, JonHarder, Benjamin Mako Hill, Grover cleveland, Huon, AgentFate2Black, Megamix, Amazon10x, Flyguy649, Aiden120000, Nakon, Savidan, Jiddisch-enwiki, Iblardi, Dreadstar, Whatupshorty45, BryanG, Wybot, DMacks, Yom, Kotjze, Katt, Zzorze, Aaker, Djwhornplayer, Vina-iwbot-enwiki, Ifrit, Nov ialiste, Awxdotcom, Weatherman1126, SashatoBot, Lambiam, Yannismarou, Nishkid64, Molerat, Soap, Kuru, J. Finkelstein, MayerG, J 1982, Heimstern, JSimin, CenozoicEra, KarlM, JorivS, Goodnightmush, Dittyh39, Peterlewis, IronGargoyle, Ckatz, Stoa, Basilbrushleo, A. Parrot, J Crow, Astuishin, Slakr, Hvn0413, GenericGabriel, Beetstra, Godfrey Daniel, Alatus, Vaniba12, Roregan, Geologyguy, Midnightblueowl, Ryulong, KirrVlad, Citicat, Peter Horn, MTSbot-enwiki, H, Shal Dengeki, Jose77, Squirepants101, KJS77, PaulGS, Love me 33, Ez910503, Mguardado77, Iridescent, Michaelbusch, Alessandro57, Tcwilliams, Kapohogrrl, Henrymark, Pegasus1138, N-edits, Jrundin, David Cruise, Twas Now, Provocateur, Sahuagin, LadyofShallott, Marysunshine, Bud-E, Courcelles, Bruinfan12, LonelyPilgrim, Tawkerbot2, Axt, Mustbe, ChrisCork, Deses, Internedko, Szfski, JForget, GeneralIroh, DangerousPanda, CRGreathouse, CmdrObot, Godwynn, Ale jrb, Geremia, Dycedarg, Abramring, Van helsing, The ed17, John Riemann Soong, Makeemlighter, Eric, Maxflight, KyraVixen, Dgw, El aprendelenguas, MarsRover, WeggeBot, Neelix, FilipeS, Ph0kin, Vectro, Cydebot, Mblumber, Jasperdoomen, Airridi-enwiki, Future Perfect at Sunrise, Reywas92, Cantras, VashiDonsk, Smartdude101, Nick Wilson, Gogo Dodo, R-41, Lllort, I.M.S., GordonE, Sempai, Dusty relic, Tkynerd, Ej81, Shirulashem, HitroMilanese, DumbBOT, Plasticbadge, Englishnerd, Optimist on the run, Sirmylesnagopaleentheda, Garik, Waxigloo, Daven200520, Lo2u, Marekmiller, Laparapa, Bwmcmaste, Thijs!bot, Epr123, Wachowich, NJPharris, Balonkey, Qwyrxian, Brainboy109, Jd2718, Hazmat2, Nonagonal Spider, Sobreira, Marek69, Diggy28, A3RO, Tellyaddict, Joymmart, JustAGal, Davidhorman, Fobia, J. W. Love, Eb.eric, Random Tree, Sam42, Dawnsseeker2000, Escarbot, AntiVandalBot, The Obento Musubi, Milton Stanley, Majorly, Luna Santin, Widefox, Grich, Shirt58, Prolog, Tangerines, Madder, Jj137, Scepia, Dylan Lake, TK-925, BigSciZot, Lfstevens, Myanw, Futurepower(R), Crissidancer88, DarkAngel007, Deadbeef, JAnDbot, Mazito, Gatemansgc, Deflective, Husond, Poga, Dr Sophist, Wikiman 24, Mco-razao, Sanchom, Sigurd Dragon Slayer, Andonic, Igodard, Retroviser, Dr mindbender, Rotherpe, Memphisto, Magioladitis, Augustus Sabius, Bongwarrior, VoABot II, LawrenceTrevallion, Dannyc77, JNW, JamesBWatson, Mclay1, Think outside the box, Rhode Islander, Ezgirl, Twxs, Majorarcanum, SparrowsWing, T3gk, Avicennasis, Thunderhead-enwiki, Meissmart, CodeCat, Robotman1974, Xddbxx, 28421u2232nfencenc, Pedrocelli, Clocksarecool, Allstarecho, Cromperu-enwiki, LorenzoB, Macboots, Fang 23, RedMC, JoergenB, Glen, DerHexer, Esanchez7587, Pax:Vobiscum, Ethan.exe, Hermanater77, Gun Powder Ma, Hdt83, MartinBot, Chrismon, Andrew9019, Kuamudhan, Natron88, Ultraviolet scissor flame, R'n'B, Purple heart78, Imperatrix max, AlexiusHoratius, Vox Rationis, LittleOldMe old, Lilac Soul, Seanbarnes, Ssolbergj, J.delanoy, Nev1, Trusilver, Cyborg Ninja, Huey45, Numbo3, Hans Dunkelberg, Maurice Carbonaro, Vacharon, Yonidebot, Jonpro, Zzzyyy, Chopin-Ate-Liszt!, WarthogDemon, Susana Freixeiro-enwiki, Thesarahar, Elistir, Good-afternun!, Mathglot, SmithBlue, Billydeek, It Is Me Here, Bot-Schafter, Katalaveno, McSly, Samtheboy, Classicalsubjects, Rayizmi, Renegade Replicant, Alphapeta, Kazu89, Midnight Madness, Belovedfreak, NewEnglandYankee, Aginos-enwiki, Bobianite, Touch Of Light, Vchurchill2006, Chenhsi, Sunderland06, Yablochko, Phrartcom, KylieTastic, MixalisOwen, Fletcher3328, Political Research, RB972, David.Federman, DorganBot, Micro01, TerryfaeScotland, Ja 62, AndreasJSbot, Jarry1250, Andy Marchbanks, Useight, Kakarot6-enwiki, Greg-si, Steel1943, Idioma-bot, Vishnuandthecops, Spellcast, Mastrchf91, Zakuragi, Cheesemonkey118, DrkDragon552, X!, Cal Evans, Deor, Shaggers, 28bytes, VolkovBot, CWii, JGHoves, Murderbike, Macedonian, Jeff G., Johnny Au, Indubitably, TheMindsEye, Loki-Clock, Bacchus87, Dominus Ludus, Thakurji, George Adam Horváth, LeoJohns, Dougie monty, Szpucsu, Philip Trueman, Fran Rogers, RPlunk2853, Iloveprocrastinating, TXiKiBoT, Dajwilkinson, Oshwah, Mercy, S-tron, OverSS, Vipinhari, Hqb, Emmo827, Z.E.R.O., ElinorD, Ppooop, Crohnie, Gen. Quon, Arleyl, Carl1994, Yaanch, Anna Lincoln, Una Smith, TheMexican2007, Lradrama, Sintaku, Clarence63, MINGESELLE299, Dendodge, Melsaran, Awl, Dolphinn, Fortethefourthversion, Abdullais4u, LeaveSleaves, Drappel, Bentley4, Crónica-enwiki, Notbyworks, Cremepuff222, Geometry guy, Impert, MrMelonhead, Themat21111, Ozalid, Billiot, Dvmedis, Aaron rabba, Synthebot, Redsox92, Wesley Holt, Falcon8765, Enviroboy, Burntsauce, WatermelonPotion, Kolbykoz, Monty845, AlleborgoBot, Praefectorian, Logan, Mario1952, W4chris, IndulgentReader, RedRabbit1983, EmxBot, Assgulf, Polystrength, Demmy, Elisevs, Ponyo, Havenner2006, Input Early, Explodes42, SieBot, Froztbyte, Heb, Helmski, Tosun, Tiddly Tom, The silent assassin, Jauerback, Rockerdudeman, Jbmurray, Caltas, MisterI nothing, Cwkmail, Astrovega, This, that and the other, Yintan, Ncfuzzy101, Grundle2600, Keilana, Rhanda1353, Pxma, Snead888, Oda Mari, Elcobbola, Nebulosity, CutOffTies, Rook37, Antonio Lopez, Targeman, Lightmouse, Techman224, Hobartimus, Martinlc, Aramgar, IdreamofJeanie, Jasmina Ravnjak, Nikkislayers7, Stfg, StaticGull, Slowik, Mygerardromance, Rokpok, Kortagio, Nergaal, Hansh, Mumble45, Tiny plastic Grey Knight, C0nanPayne, 3rdAlcove, Velvetron, Stanstaple, John321111, Dlhroher2003, Jh1597, TarquinWJ, Leushenko, Atif.t2, Loren.wilton, Ellassint, ClueBot, Aggfvavitus, NickCT, GorillaWarfare, Pressforaction, Traditions849, Nielspeterqm, Tonymontana05, The Thing That Should Not Be, Nicolas Andrew, Fated Destiny, Fadesga, Goethicus, Kafka Liz, Nnemo, Pi zero, Gaia Octavia Agrippa, Arakunem, CHasouros, NovaTabula, Drmies, Crashkevlar, Niceguyedc, Blanchardb, LizardJr8, Bob bobato, Singinglemon-enwiki, Jfblanc, Leeheonjin, Grunty Thraveswain, DragonBot, Miles111, Robert Skyhawk, Excirial, Jusdafax, Abayof321, Wikiscribe, Eekster, Commandochic09, Jimmy1993, LeonardABloom, Bchaosf, JimmyPhysics, Lartoven, Michael j. iwai, TheResearchPersona, Sun Creator, Edinga001, NuclearWarfare, Monkeybalss, Hudgensgal, Jotterbot, Rezistenta, RC-0722, Tnxman307, Basketball110, Loel, MJDTed, VsevolodKrolikov, Dekisugi, Mkacello, Geo0910, Thingg, Jtle515, Aitias, Sdalvador, Versus22, Wgsfw333, Egmontaz, LaruaWA11, DumZiBoT, Djneufville, Cnoguera, XLinkBot, Light arches, Jovianeye, Rror, Arsyed91, Little Mountain 5, Avoided, Xaraphim, Mitch Ames, Issac blast, Facts707, Ilikepie2221, Skarebo, WikHead, Calakmul2003, SilvononBot, Metrodorus2008, NellieBly, Mifter, Badgernet, Alexius08, Mm40, Qwertyuiop19166, IareEditing, GTH1, ZooFari, Torchflame, Airplaneman, Llama88, Kbdankbot, CalumH93, Wyatt915, Richard STROKER, Wiki Power Editor Dude, ERK, Proofreader77, GeekyTwin, Pshycofreak, Latinkiss, Jafeluv, Yolgnu, Texterone, Anakronos, M.nelson, LightSpectra, Guanako512, 157.228.x.x, State87, AkhtaBot, TutterMouse, HermXIV, Laurinavicius, Cuaxdon, Alexlykke, Itom2, Kingsboysarecool, Kman543210, Vishnava, CanadianLinuxUser, Mrtwata, Jorell123, Victorbiteyabulloksoff, Jim10701, Mentisock, LaaknorBot, Jamie1743, Trabajaba, Ccacsms, Glane23, Freakzap, Glass Sword, Zahr Dalsk, Favonian, SpBot, LinkFA-Bot, Ramazement, 5 albert square, Ks 7508, Kokonilly, Numbo3-bot, Ehrenkater, Erutuon, Blacktatsu, Tide rolls, OIEnglish, Madsmegger, Krano, Jarble, Jimsve, Brent2009, Frehley, The Bushranger, ChrisopherusP, Luckas-bot, Yobot, Theserialcomma, Fraggel81, Rshire3, II MusLiM HyBRiD II, Abasass, PMLawrence, NERVUN, Thunderman1234, Bavaria72, Eric-Wester, Synchronism, Mdw0, AnomieBOT, Andrewrp, DemocraticLuntz, Rubinbot, Iexec1, Jim1138, IRP, Galoubet, Pyrrhus16, Dwayne, PIANO non troppo, Legumeman, Aditya, Kingpin13, Glenfarclas, Пика Пика, Ulric1313, Yankees13220, 95jb14, Materialscientist, BigLoo, Nolmcall, Paranormal Skeptic, Chromenano, Citation bot, Dobrydneyj, Nikolay94, Coreyyi66, ArthurBot, LovesMacs, Haidata, Hackman1, LilHelpa, Xqbot, Chefukija, Parramattaz, Tasnutaer, Swazamee, Phthinosuchusisanancestor, The sock that should not be, Suitawty, Capricorn42, Renaissancee, Backpackgirl, Mononomic, Lele giannoni, Iwillglosow3126, TheWeakWilled, Nick.anderegg, Tomja-enwiki, Tad Lincoln, The Evil IP address, Taurusrat, Agnizium, Daddy was here, J04n, GrouchoBot, Abce2, Nayvik, Urmotheron, Iudaeus, DZadventiste, Jsicwr54, Omnipaedista, RibotBOT, SassoBot, TonyHagale, Brickline, Pereant antiburchius, Wakinget, Doulos Christos, BSTemple, GhalyBot, Shadowjams, Methcub, Rrr999rrr, Godisfake, E0steven, LJElliott21, Novem Linguae, Haploidavey, Dougofborg, Haldraper, FrescoBot, SultrySuzie, Tangent747, Shrader12, Darkskynet, Lothar von Richthofen, Moferjake, Osteoderm Jacket, King-

guy1, Zero Thrust, Davedeve, HJ Mitchell, Chewitt321, BenzolBot, Grifter72, Jamesooders, Dhtwiki, CircleAdrian, Cannolis, Oalp1003, Citation bot 1, Javert, Finn Froding, Cmhood, Pinethicket, I dream of horses, HROestBot, DjDave98, Chemwi, Loyalist Cannons, AmphBot, Bbvslg, BigDwiki, Hamtechperson, A8UDI, BRUTE, RedBot, Buyobuyoenwiki, Serols, SpaceFlight89, Pianoplonkers, TEH AR-BITUR, Bacek, Just a guy from the KP, Malakas4, RandomStringOfCharacters, Footwarrior, DaniusArcenus, DeoDonatus, Pedromelcop, Merlion444, Utility Monster, Cnwiliams, FoxBot, TobeBot, Aphasia82, Happyandrew1994, Rooster Man 3, DrBaruz, الـنـفـر, Lotje, Oracleofottawa, Vrenator, Pbrower2a, Stultae, CaesarAugustusDivusIulius, Jeffrd10, Stephen MUFC, Gaelles, Tbhotch, Dortega94, Sevunthowzand, JeepdaySock, DARTH SIDIOUS 2, Difu Wu, Andrea105, Onel5969, Kanzler31, Mean as custard, Rekhyt Imhotep Ptolemy, Superflocinaucinilipilification, TjBot, IANVS, Bhawani Gautam, Noommos, Jimtaip, Marotaa, Born2bgratis, Benedict AS, AnAbsolutelyOriginalUsername42, Tagtool, Esoglou, EmausBot, John of Reading, WikitanvirBot, Chazyb01, Ajraddatz, Zollerrii, SorinMarkov, Jmullaly, Syncategoremata, CheesePuffsandrice26, GoingBatty, RA0808, Pio35, MoeHockey, RenamedUser01302013, HeliosX, ThePCKid, Lss5281, KHamsun, Solarra, Icountryclub, Slightsmile, The Mysterious El Willstro, Tommy2010, AnthroMimus, Wikipelli, K6ka, Djembayz, Tylerhyatt1234, Thecheesykid, Italia2006, Jesmeister9, ZéroBot, CanonLawJunkie, Elmodude4, Eman3572, Whiteoctave, MarkLuc, Askedonty, PotatoBot, Érico, Aronlee90, Stlzyty, Perferens, The89thGuy, LucienneRieux, Gabrielgnr, Azuris, Vogle t13, H3llBot, Ibreakwiki, Quae legit, Wayne Slam, Cosman246, Ocaasi, Neddy1234, Wabbott9, The MAs3r, MaxErdwien, TyA, Brandmeister, The Talking Toaster, Byronjames123, Donner60, Dk1919 Franking, Fahimrazick, Winstonlighter, Rodmarcia, Thewolfchild, ChuispastonBot, Jimmygraf, Zaspino, ClamDip, Iketsi, Jasonli42, Lguipontes, Kostinos, GrayFullbuster, Adgfha, 28bot, Mdk6778, Mjbmrbot, ClueBot NG, BassistofNC, Mechanical digger, Rich Smith, Gareth Griffith-Jones, Akuindo, Daniel1362, Sirkiller, Hyugopdr, CocuBot, MelbourneStar, Ckoun, Excelsius, Farvardyn, Shinli256, Loginnigol, Encyencyency101, Causecity321, Kizmeimirish, SilentResident, The Master of Mayhem, Frietjes, Hazhk, Cmanhattan24, Jeffreyhui9771, Rezabot, CopperSquare, Widr, Cognate247, Wetherwacky, Chronology of Life, Richardblndl, Swissguar007, Secret of success, Mutley100, Helpful Pixie Bot, Akshayak29, DarkTide, Msd2001, Tdimhcs, WNY98, Zyztem2000, Lowercase sigmabot, BG19bot, Larsson10, Petyka1, Jay8g, TCN7JM, Wuy21, Wattseydog, Only Red, Pigface8442, Ūnus ē Latinis novīs, Cthulhu Rising, Frze, AvocatoBot, Momgo1234, Mocasar, Geraldo Perez, Stelpa, Davidiad, Nonchalantofthere, VitaAeterna, Garsd, Arjunkmohan, Yeah12233, Gorthian, Joydeep, SmellyLilYou, Keelan leeper, Awsonemnic, Vkoves, Min.neel, HMman, Max0987654321, Word dewd544, Brockbelfield24, Glacialfox, Bd-jaan, David11619, Matthew David González, Dominic338, Loriendrew, Zoom Grammaire, Cengime, Don of Cherry, E.mas26, Maddiegraham234, Edward123123, Duggamudugga, Mintien, Ishpish2612, Saul12321, Mathisgarbage, Realornotreal, Bscy9, Crazycolton55, The Illusive Man, ChrisGualtieri, Kbih67, HarDan, Fhjmi54, Khazar2, EuroCarGT, Esszet, Wonderfishman, JYBot, Linguistik, Jayjake9, E4024, Dexbot, Irishyankee24, Hmainsbot1, SoledadKabochoa, Mogism, GyaroMaguus, Jots and graphs, Selteab, CuriousMind01, Fête, Lugia2453, TheNano7474, SFK2, Krakkos, Mhenderson5, Minime12358, Asalygar, DavidPKendal, 069952497a, Ekips39, 77777, Secondhand Work, Valkura, Foghe, Afroninja1234, Everymorning, Jakec, Soffredo, Keiranstrefford, Ste1laeres, Msundqvist, Me1234567891011121314, EvergreenFir, Saralikesart, DavidLeighEllis, Jan Kaninchen, Dr.Gulliver, Blandricky9986, Jason11113, Abrasax108, Silviu Tigu, MrScorch6200, QuestionForYou, Latina Amator, JohanBaten, Salvatore.federico, Moe Leistcer, Jleher14, Loljov, Wkimmdmd, Dickbreath, Holtztratner459, L00naTiCtAc, Thewillsterr, Zocalo361, Craigrottman, Speling12345, Abgar eabe ghu, Melcous, Monkbob, Kelvinmike09, SantiLak, Eggsalad123, Waggie, Trackteur, Vallanne, Josephchenlin, Puterchip, Ansis Grey, Fewatwrsa, Noldoxis, AllOfThem, Peter238, Joseph Yanchar, GShoeLacy, Catobonus, Sigehelmus, MRD2014, DJC123, Sapphique9, Narky Blert, DangerousJXD, Neeabh, Paraparaumu.gurl, Zppix, Youngg1993, Jdlw, Trisoaten, Sdxu, Analthrasher666, DavidJac, Kethrus, StewdioMACK, Sam Windsor, Rok00rock, WIKI Editorail-True, LATIN1JOKE, Joseph2302, Bronze2018, Cheesychoosticks, Hf5757, Wpabdelhjhfhjdghfghf, CanoeOfDave, KasparBot, Jakehamlin6, WIMwizad, Sammy Dam Dam, Angelosoftheeep, Poppirockie, Sweepy, Rosetylerohyeah, Gideon2204, 12345Romellie, Dontlookatmeever, JasonJaber42, Kanjuzi, Pilotdonkey414, Bshred8, Swedenwish, Fuortu, Gemmellms, Widgia, Funkyman99, Bonupton, Woodstop45, Linguist to be, BenjaRoh, JonathanSchoots, Cricket--94, Justenanindo, Patsersvdb, Lycra 8415, Ylyon84, JamesHopwood, DoMeat, Superfunlovingpartyman, Ephao and Anonymous: 2096

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